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House Sanitation.

NOTWITHSTANDING all the improvements that have been effected in matters relating to sanitation during the last twenty-five years, there is probably no other subject upon which so much money has been uselessly expended through imperfect knowledge. From the main drainage scheme of the metropolis upon which millions were spent, and which, according to the most trustworthy recent opinions, was foredoomed soon to become inadequate to the work which it has to do, down to the simplest drainage arrangements of a small house, the instances have been very few,—so few as to form the exceptions which prove the rule,—where expensive alterations from the original plan have not been rendered necessary.

Originally, no doubt, mistakes were made through ignorance of the general principles of sanitary science, but since these principles have become known and acted upon, far more faults have been committed and injury done through want of knowledge of the practical details involved in carrying out the principles. And this will inevitably continue to be the case until the local authorities make up their minds that an official investigation of *all* sanitary appliances inside a house is a far more important matter than the mere casual inspection of the junction of the house-drains with the main sewer. The health of the community is the health of the individuals composing the community, and this depends to a very large extent upon the sanitary condition of the interior of the dwellings in which they live, and if this be bad the most perfect system of main sewerage will be useless to prevent disease. Many of the American and Colonial cities are far in advance of us in this respect; for instance, in 1881 the Legislature of Illinois passed a law making it compulsory that all plumbers or persons interested in contracts for plumbing work should receive a written certificate from the Health Commissioners before commencing any work, and after completion should not cover it up until it had been inspected by the Commissioners. Towards the end of the same year it is recorded that a plumber in Washington was fined 25 dols. for not ventilating a soil-pipe. In Philadelphia a recommendation has been made to the Council within the last two months that all master plumbers should be registered and licensed by a Board consisting of the chief Engineer and Surveyor, the Engineer of the Water Department, and a member of the Board of Health, who must be a physician. Every householder and every architect who has had experience of the wretched way in which, with some honourable exceptions, plumbers' work is habitually done in this country must devoutly wish that some such regulation existed here. It is true that there are now a number of sanitary engineers ready to carry out all drainage requirements in the most approved manner; but, as a rule, "sanitary engineer" is but old "plumber" writ large, and without the closest supervision there is no guarantee that the details of the work will be thoroughly looked after.

Among the ablest and most experienced of the honourable exceptions above alluded to is Mr. Stevens Hellyer, who seven years ago gave the world the benefit of his experience in his work on "Sanitation," the new and revised edition of which is now before us.* This work, in its earlier editions, has already become widely known as the best treatise existing on practical plumbing, and this new edition has been much enlarged, and entirely re-arranged. The additions which were printed in the second edition as an appendix to the first have now been incorporated into the body of the work, and thus appear in their proper place, and the illustrations are more numerous, several of the new ones being most instructive. The first principle of the new science of house sanitation was ventilation of pipes and drains, and this has been so incessantly dinned into the ears of the public, that they are by this time fully convinced of the necessity of it,—so fully, indeed, that even the speculating builder, who runs up the endless rows of suburban "villas," has been compelled to carry up a so-called ventilator to his soil-pipe, though it is generally absurdly inadequate for this purpose. But the second great principle, viz., the proper trapping of all pipes, has not yet become so fully recognised, and we think Mr. Hellyer has done perfectly right to dwell very fully indeed upon this subject of traps, and to show clearly what are the right and the wrong kinds of traps to use. We recollect not very long ago hearing more than one eminent architect state publicly that they could not see the necessity of trapping scullery and bath wastes which discharged into the open air. But experience has shown conclusively that whatever care may be taken in flushing out such pipes, it is impossible to prevent accumulations upon their sides, which speedily become foul, and contaminate the air passing through them; and the greater the length of such waste-pipes, the worse will they become, so that the traps should always be placed as close as possible to the sink or bath, as the case may be.

One of the most important principles which Mr. Hellyer insists upon is the desirability of keeping all traps as small as possible consistent with the work they have to do. And this applies to the drains and pipes themselves as well as to the traps; the same body of water will have far greater flushing power in a 4-in. than in a 6-in. drain. In this connexion we were rather curious to see what Mr. Hellyer might have to say in his new edition as to one of his own inventions, which was probably at one time a favourite bantling of his, for it occupied the post of honour as an illustration on the cover of his previous edition. We refer to the triple dip-trap (p. 62), which certainly has a very enticing look about it, but which always struck us as being defective, in that the second chamber would not be easily cleansed. We are extremely glad to find that Mr. Hellyer has come to the same conclusion, and states frankly that he now condemns this trap as "unfit for use." Considerable difference of opinion existed at one time as to the precise value of the water-seal of an ordinary trap in excluding noxious gases from a house, and the first advocates of ventilation and disconnexion were so fully impressed with their necessity that they somewhat unduly discountenanced the idea that a trap could exclude sewer-gas under pressure. The question could only be settled by experiment; and Mr. Hellyer describes a very interesting apparatus devised by himself, by means of which he claims to have proved conclusively that a water-seal of 1½ in. is capable of resisting the passage of gas at considerable pressure. Mr. Hellyer, of course, would not rely upon traps without ventilation; but his point is,—and we think he makes it good,—that without traps you run the risk of introducing into a house foul air that would be much better kept out, and that can be kept out by the use of traps. It has been known for some time that all traps are liable to syphonage unless they are properly ventilated, and one of the most instructive chapters in this book is that in which the best plan of ventilating traps is discussed. This syphonage would not do much harm if caused only by the discharge of water through the trap itself, as there would generally be sufficient drain of water to re-seal

* "The Plumber and Sanitary Houses. A Practical Treatise on the Principles of Internal Plumbing Work and the best Means for excluding noxious Gases from our Houses." By S. Stevens Hellyer, author of "Lectures on Sanitary Plumbing." Third edition. London: B. T. Batsford.

the trap; but if it is caused by the sudden discharge of water through a branch pipe, no such re-sealing can take place, and therefore this is the special risk to be guarded against. Mr. Hellyer carried out a large number of experiments in order to ascertain the precise effect of ventilating the traps, and he gives details of no fewer than eighty-five of these experiments, and also illustrates them very clearly by excellent diagrams. The general results of these experiments show that if several closets or other fittings are connected by branches with a long length of main pipe, the traps upon the various branches will not retain their seal unless ventilated by a pipe on their outgo side, which pipe must not be too small, and should be carried up and branched into the main pipe at a point higher than the junction of the highest branch. This method is more effectual in preventing syphonage than if the pipe is taken out into the air separately.

It would take too long to follow Mr. Hellyer into the detailed description which he gives of the various water-closet apparatus now in use. His remarks are always practical, and he appears to us to be very fair, for, although he naturally has a predilection for his own inventions, he never condemns anything without giving his reasons fully. We are very glad to find his remarks upon water-closet seats, for anything more idiotic than the way in which these are generally made it would be difficult to find. If the cost of a flap were expended upon hinging the seat, an enormous deal of trouble would be spared. But it is not the fittings alone of water-closets that are at fault; in too many cases the entire construction of the rooms is eminently unsanitary. They are nearly always too small, and sufficient care is not taken to prevent smell from passing into other rooms, and above all the windows are not large enough. By a curious sort of perversity those rooms in a house which require the freest circulation of fresh air invariably have the smallest window openings, as if the builder thought it necessary that the location of these places should be apparent to every one outside the house as well as inside. Mr. Hellyer has some very apposite remarks upon these points, but we cannot help thinking he might slightly improve the plan which he gives to illustrate his views. At page 236 is shown a water-closet in which the partition between it and the lobby is made good to the centre mullion of a two-light window, half of which lights the lobby and half the water-closet. Now, this is an arrangement which should never be resorted to unless it is absolutely unavoidable. In the case in question there is certainly no necessity for it, and if the lobby were not shut off from the staircase it would be most objectionable, but even as it is, and under all circumstances, we prefer a perfectly separate window to the water-closet. We admit this is rather a small point for criticism, but Mr. Hellyer's book is so good, and the illustrations will be looked upon as typical of what is the best arrangement to be adopted, that we have thought it worth while to notice a little matter like this, which is capable of being misunderstood by any one not thoroughly accustomed to read plans.

We have not space to follow Mr. Hellyer into the details of his arrangements for keeping bath-rooms, lavatories, sculleries, and all parts of a house in a thoroughly pure and sanitary condition, but we must notice one very great improvement,—which is illustrated for the first time in this edition,—in the construction of a grease-trap for scullery sinks. This problem of dealing with greasy water is really, in a small way, one of the most difficult of solution. If the grease-collecting tank is too large, the accumulations speedily become very offensive, so that on principle we much prefer a small one; but, on the other hand, the actual operation of cleaning out such a tank is so disagreeable that servants will put it off as long as possible. Mr. Hellyer seems to have got over this difficulty by keeping the inlet and outlet pipes quite clear of the chamber itself, in which is inserted a perforated tray with two long handles by which it can be lifted out without any inconvenience as often as is required, the water flowing through the perforations and leaving the congealed grease in the tray. Another good feature of this grease-trap is that the whole can be easily got at for the purpose of thoroughly cleansing.

Mr. Hellyer follows his description of traps and waste pipes with two chapters on water storage and supply, in which he speaks strongly, but not at all too strongly, of the absurd regulations of the water companies in not allowing water-waste preventers of a greater capacity than two gallons. He also shows by some excellent illustrations new to this edition how cistern-water becomes contaminated by bad arrangements and bad workmanship. Details follow of an exhaustive series of experiments with ventilating cowls, as the result of which Mr. Hellyer awards the palm to a rival manufacturer, and the book concludes with a chapter of excellent advice to workmen. In the preface to the new edition it is stated that "no detail has been considered too small to dwell upon," and we do not think we can give higher praise to the work than by expressing our conviction that the statement is perfectly warranted. The only persons who are likely to complain of Mr. Hellyer are the purchasers of the former editions, to which the new one is so superior that they will be compelled to add it to their libraries.

ENGLISH FORESTRY, THE COMING EXHIBITION, AND THE USE OF WOOD IN BUILDING.

THE Forestry Exhibition which is to be held in Scotland during the ensuing summer has a strong claim on public support. The subject is one that touches the national welfare in many points. The rapid development of mineral industry that has been fostered by the steam-engine has led us to treat the vegetable wealth of the island with blind ingratitude. English oak, of course, is no longer guarded and cultivated (as English yew was in Tudor times) as the special gift of nature on which depended the excellence of the English navy, and thus the inviolability of the English soil. The demand for quicker-growing and less precious timber, for the purpose of fuel, has been superseded by the cheap winning of coal. The neglect in question is not peculiar to the British islands. And it is probable that it is to the non-commercial element of parks, ornamental woods, and similar preserves of timber, that we owe our escape hitherto from the desolating Nemesis that has elsewhere attended on the violation of the homes of the sylvan gods. To the poetic fancy, says a modern writer, the very word "forest" recalls the scene of some legendary drama. A dreamy languor, such as that which the cool shade of lofty trees causes to the senses, steals over the mind with the thoughts of the green canopy spread by the young leaves of the beech, the solemn shadow of the pine woods, the dark and scented obscurity of the orange grove. The fairy folk keep their last hold on our fancy, and the ruder gnomes of our German kinsmen yet hold their own against the schoolmaster and the needle-gun, under the shade of ancient trees.

The amount of vegetable produce now annually imported into England is more than double that produced by the soil. To say nothing of the tropical or sub-tropical vegetable products,—cork, dye-woods, oils, resins, gums; nothing of sugar, spices, tea, coffee, cocoa; nothing of cotton and grasses, of hemp and flax, of indigo, madder, and fruits,—we import sawn or split timber, staves, and mahogany to the value of 15,000,000*l.* per annum, of which the one item that we could not ourselves produce, mahogany, stands for under 400,000*l.* Our imports of timber not sawn and split, down to 1868 (the last year in which they figure in the "Statistical Abstract"), stood steadily for some years at about 5,000,000*l.* in value. We look in vain for any corresponding item among our exports.

Our colonies supply us with much timber better suited for many of the purposes of the wheelwright, the carriage and wagon builder, the cabinet-maker, and the upholsterer than our own soil can rear. As to the ship-builder, wood is for him a thing of the past. And iron, even before it has driven wood from the yards of the shipbuilder, is in its turn being displaced by steel. The teak and the sal of the East Indies, the mora and the greenheart of British Guiana, the iron-bark and many other of the gum-trees of Australia, are all stronger than British oak, in resistance both to breaking and to crushing weight. In 1867 the Science and Art Department published a series of experiments made by the late Captain Fowke, R.E., on upwards of 600 kinds of British, Colonial, and other woods. The range displayed in physical qualities is extraordinary, and is such as to intimate how wide is the field as yet unexplored by the worker in wood. The dedoaf tha, from East India, has a specific gravity of 0·260, which is only 0·010 more than that of cork. The ironwood of Jamaica is nearly five times as heavy, having a specific gravity of 1·254. A weight of 4,256 lb. breaks, and one of 4,280 lb. crushes, oak (the pieces experimented on being each 2 in. square and 16 in. long), while the breaking weight of the iron-bark is 11,158 lb., and the crushing weight, 13,349 lb. In the present style of house-building these colonial woods ought to be well known and freely used by the builder.

The extent to which the timber crops of the United Kingdom have been neglected in recent times is remarkable, as compared with the former state of things, and is certainly not without its serious consequences. In Ireland, for instance, there is no feature of the landscape more characteristic than the desolate baldness of the hills. The barrenness in this respect is, however, of recent origin, and is but an example of that gross neglect of this great source of national wealth which is by no means peculiar to Ireland. In the bogs are found quantities of large timber, generally fir, birch, and oak, the former so impregnated with resin that a splinter burns like a candle. From the early histories of Ireland it appears that the country was formerly remarkable for the extent of its forests. Out of a total area of nearly 21 million acres the woods and copses of Ireland now are less than 330,000 acres. In Great Britain, out of nearly 57 million acres, 2½ millions are now thus returned.

The forests of Europe are estimated to cover 500 millions of acres, or nearly 20 per cent. of the surface of the continent. In British North America there are said to be 900 millions of acres of forest, in the United States 560 millions, in South America 700 millions. The total thus estimated for Europe and America alone is equal to 3,600,000 geographical miles, each containing 736 English acres. It is interesting to compare this area, so far as the possible supply of fuel is concerned, with that of the coal-fields of the world, which is estimated at 134,000 geographical miles. Of this area one-twenty-fifth part is in the United Kingdom, or 5,360 geographical miles of forest, against 5,000 geographical miles of coal-fields in full work. Four-fifths of the known coal-measures lie within British and American territory, the forests of Europe and America covering twenty-seven times the area of the known coal-measures of the world.

In Baden, where the forest statistics are carefully prepared, the annual production of wood is less than the weight of hay that can be grown on an equal area. At that rate,—which is low for an average,—each geographical mile of forest will yield, one with another, 1,500 loads of timber per annum. But a square mile of coal-measure yields something like 20,000 tons in the year. The latter produce, however, is limited and exhaustible. Extract the coal, and not only is there an end of the fuel, but the soil itself is generally reduced to utter waste. Arrange the forest according to the best theories of forestry, and its yield is perpetual.

Hanover is the European country in which scientific forestry is now probably in the most advanced condition. A forest, under the most perfect regulation, is divided as nearly as possible into six equal areas, one full of trees not exceeding 20 years in age, a second containing trees of from 20 to 40 years old, and so on. In the latest block, containing trees of

from 100 to 120 years old, felling is commenced, the old trees being carefully and successively removed, and care taken, at the same time, to replace them by the growth of seedlings. It is thus endeavoured to preserve, as far as possible, the features of the natural growth of a wild forest, and, at the same time, to extract a definite and calculated harvest of wood from the soil.

Under English rule, on the other hand, according to no less an authority than Sir J. Hooker, "apathy, or at least inaction, everywhere prevails," as to the preservation of woods and forests. "The annals of almost every English colony repeat the tale of wilful, wanton waste and improvidence." In 1830, 4,000 miles of sal forests draped the feet of the Himalayas. The sal timber is almost the only wood that will resist the Indian climate, and its insect inhabitants, for railway purposes. But in 1867 the East Indian Railway Company were positively driven to import pine sleepers from Norway. In 1830, out of 66,000,000 acres, in round numbers, forming the area of New Zealand, 20,000,000 acres were under forest. In 1873 the latter had shrunk to 12,000,000 acres. If the waste were allowed to continue at the same rate, the island would be bare of timber by 1893.

Timber, as fuel, may be regarded as coming into competition with coal when the latter sells at about 17s. per ton, the timber at the same time being as low as 1½d. per foot cube. In 1874 the price of our coal was averaged at 17·29 shillings per ton, but its present value is only about 9s. 6d. per ton. That inducement to cultivate timber for fuel purposes which we must conclude likely to follow the exhaustion of the mineral store of coal and of petroleum may thus be a long way off. But the folly of neglecting our forest growth is none the less. Of all purposes to which wood can be put, perhaps the least remunerative is that of combustion. To that, it is conceivable, we must come by-and-by, but at a period of which the distance is indicated by the amount of the stores of available mineral fuel. Neither need we entertain over-anxiety as to the habitability of the planet in the time of our great-great-grand-children; as the now wasted powers of nature—the tidal energy, if not that of the wind, may be by that time yoked to the service of industry. However that may be, it is satisfactory to know that it is within the power of scientific forestry to secure an unfailing supply of timber by serial culture and felling.

Apart from fuel, the uses to which timber may advantageously be put are so numerous as to render scientific cultivation an important element of national wealth. Although steel has superseded timber for ship-building, the architect will usually prefer the more ancient material of construction. Especially we call attention to the value of the heavy straight-grained woods which we have previously mentioned for joists, beams, props, and similar uses. It has been stated, and we believe correctly, that beams and pillars of solid oak, such as exist in some of our old Elizabethan mansions, are far better suited to resist destruction by fire than are cast-iron girders and columns. While a quarter or half an inch of the solid log would be gradually charred, the metal would have yielded to pressure or to fracture. This advantage may be presumed to be even greater in the case of wood of higher specific gravity than oak. Passing from the construction to the finishing and decoration of the house, what material is equal, in the combination of the qualities of durability, comfort, health, beauty, and substantial excellence, to wood, for wainscots, panels, doors, staircases, balustrades, and the like? What floor is like an oak floor, or a parqueted floor? The artificial and jointed parquetry, which is supplied by some makers as a substitute for floor-cloth, here deserves attention. And in carrying out the whole idea of furnishing *en suite*, of making the fixed furniture of a room a portion of the same design as the movable furniture, nothing can compete with wood. In our knowledge of what can be produced by way of natural colour in wood, we have rather retrograded than advanced since the days of Queen Anne. Where do we now see the lovely variety of fancy woods that adorned the drawing-rooms of our grand-parents? It was only the other day, that on removing the grimy coat with which the neglect of nearly a century had invested some articles of furniture of the nature to which we refer, a beautiful green surface was revealed, as to which no one, as far as we are aware, has yet been able to indicate the name or origin of the parent tree. Pure white, cream white, pale and dark yellows, light and dark greens, pure black, and browns of all colours, are to be found in the veneered and inlaid cabinet furniture of the last century. Woods, in fact, afford a scale for constructive polychromy, in tints sober, certainly, compared with those marble glories of which we have heard something special lately, but not without distinct value for the artistic designer.

SOCIALISM IN ART.

MR. WILLIAM MORRIS is a poet and an artist of considerable eminence, whose opinion in matters of art is always deserving of attention. Further than this, he holds an important position as an extensive employer of labour, and may reasonably be supposed to possess some knowledge of the social needs and aspirations of the class he employs. When, therefore, we find him advocating socialistic principles, we are disposed to give ear to his utterances with a feeling of interest, in which, perhaps, curiosity is predominant, and may recognise the existence of many of the evils he points out without necessarily agreeing as to the remedy to be adopted.

The attitude of Mr. Morris is somewhat anomalous. The opponents of socialism are never tired of insisting that it can find favour only among those who have everything to gain and nothing to lose,—those disappointed ones who have fallen victims in the battle for existence under the great law of the survival of the fittest, and who wish for a reconstruction of the social fabric which would enable them to thrive upon the resources of their more industrious or successful brethren. To this class of would-be reformers Mr. Morris, as a large employer of labour, is a marked exception. He would certainly lose something by the adoption of his principles, and although he has been charged with inconsistency, he is certainly free from any suspicion of self-interested motives.

The evils that Mr. Morris, and those who think with him, propose to redress, are the extreme poverty, ignorance, and consequent depravity, in which a large section of the population are known to exist. Touching pictures have been drawn by recent writers of the sad condition of the dwellings of the poor in our crowded cities, and the revolting nature of their squalid unlovely lives. We need not be suspected of closing our eyes to facts which we long ago assisted in bringing to light; but this is not all. We are told that art is absent from the life of the modern workman; that his home is necessarily bare of art, because his earnings are so precarious that he cannot afford to purchase what has now become only a luxury for the wealthy, and that, in his working hours, he can have no share in art, because, under the present competitive system, he is compelled to work by pattern, and cannot linger over his work. "But if art is not popular,"—we quote from a recent lecture by Mr. Morris,—"it is not of the people, it is an idle and worthless toy. Therefore the progress,—nay, the very existence of art,—depends on changing the basis of society." In common with those who seem to take pleasure in decrying modern art, Mr. Morris is of course ready to tell us how much better was the condition of the Mediæval handicraftsman, who was "master of his time, free to give his whole thought and imagination to his work, and in fact an artist"; apparently forgetting that such artists were miserably underpaid for the class of work they produced, and that golden rewards are held out, under the present competitive system, for those who can but partly emulate their style of workmanship.

The competitive system,—held by political economists to be the necessary stimulus of industrial enterprise,—is the *bête noire* of socialism. To be a landlord is a sin, but to be a capitalist and an organiser of labour is to be a species of ogre who grows fat upon the produce of the workers, to whom the means of a bare subsistence is accorded as their share of the value produced. Nor does the middle-class escape condemnation. Not in his lectures at the Birmingham and Midland Institute, where a tone comparatively moderate was preserved, but in a work, for the contents of which Mr. Morris must be held responsible,* do we meet with denunciations against a class guilty of the iniquity of being contented under existing conditions. "Here," we read (pp. 50-51), "is the last class antagonism, which, indeed, is world-wide, the antagonism between the slaves of the machine, the mere social engines for producing surplus value and contributing to luxury, against the capitalist class and their hangers on, the landlords. All other antagonisms, complicated as they were, have now faded into this one simple unmistakable hostility of clearly defined inimical interests between the proletariat and the bourgeoisie." Class rivalry is, we know, a necessary result of competition, and so long as the present system continues, there will always be found extremely contrasted conditions of poverty and wealth at opposite ends of the social scale. But while we maintain that capitalism and competition are indispensable to national prosperity, it may be interesting to glance at some of the changes advocated by modern socialists, and their probable effects upon progress in general and art in particular. With this object, we cannot do better than follow the programme sketched out in the work cited above, since it is the recognised mouthpiece of the Democratic Federation, of which Mr. Morris is the honorary treasurer.

First in order, then, the proposal for land nationalisation is, at page 57, plainly set forth. "We claim, then, the land for the people, that the soil of our country, with whatever is useful or beautiful in or upon it, should no longer be held by a small minority for their aggrandisement and greed, but that it should be owned by all for all collectively, to be occupied, cultivated, enjoyed, mined, or built over, as the majority of the people shall see fit to ordain."

Without attempting to dispute the justice of such a scheme of confiscation, we will merely inquire what would be its result upon all building enterprise. Is it not an acknowledged fact, that the bad construction and defective sanitary arrangement of many modern dwellings that go by the name of "jerry" building, is mainly due to the tenure of land upon short leases, because it is not worth any speculator's while, and, indeed, would not pay him, to erect upon leasehold ground works of the same substantial kind as are found upon freehold property? But if a man feels little interest in building upon land which he only holds for a time, he will feel no interest in building upon land which he does not hold at all, and the effect of land nationalisation would be to destroy all private enterprise in building. The duty of erecting dwellings, churches, public offices, &c., would then devolve upon the State, which could not, of course, study to meet the demands of individual fancy. Some system would have to be adopted, and perhaps we should have the felicity of seeing a national style of architecture by law established, under which every man's house must be exactly like his neighbour's, any difference in size or magnificence being opposed to the principle of social equality.

At page 58 we are informed that "Socialists have no factious prejudices, and are influenced by no jealousies of a clique. We call, therefore, also for the immediate management and ownership of the railways by the State, so that the inland communications of the country may be under the control of the people at large, and carried on for their benefit, regard being had to the full remuneration of the labour of all

* "A Summary of the Principles of Socialism." Written for the Democratic Federation, by H. M. Hyndman and William Morris. London: The Modern Press, Nos. 13 and 14, Paternoster-row, E.C.

who are engaged in the work of transport." And again, "As with railways, so with shipping. There the whole economical forms are ready, in the same way, for immediate management by the State, and the transfer could be arranged almost without a hitch. With mines, factories, and workshops, more direct interest by the workers engaged in them would be needed, but as education extends, and the habit of economical collective freedom grows, it will be as easy for the labourers to choose their own superintendents, and apply the best machinery, as it is for the capitalist to choose and use them to-day."

In the proposed State appropriation of railways and shipping, the socialists foresee the beginning, but not the end, of the revolution they wish to promote. To place the results of vast industrial enterprises, called forth by competition, under the permanent control of the State, would be to paralyse all efforts towards further improvement. The machinery of Government always moves tardily, and it is necessary to the avoidance of blunders that it should do so; but its labours would not be facilitated by an increased amount of work. It is sufficiently difficult, under the existing Patent Laws, for an inventor to utilise his ideas for the benefit of the world at large, but the difficulties would be multiplied tenfold if the command of all our engineering appliances were vested in one authority,—the State, as representing the nation. Then the ingenious inventor who desired, for example, to improve our means of transit by land or sea, would be precluded from embodying his ideas in a practical form at his own risk as a capitalist,—would have, as a matter of fact, to ask the consent of the whole nation to co-operate with him, and would probably prefer selling his invention to some foreign despotic power not yet subjected to the tyranny of socialism.

With regard to mines, factories, and workshops, some difficulty seems to have been scented, as it is admitted that "more direct interest in them by the workers would be needed." Perhaps this is because the world has seen some socialistic experiments in these branches of industry, though not yet on the gigantic scale recommended. Co-operative societies of a communistic character have existed for the purposes of production, not only in this country, but in America also, and with some degree of success. Provided the persons co-operating are limited to a small number,—say fifty or sixty,—the feeling of joint interest is sufficiently strong to exercise a wholesome influence upon each unit. Every man feels that the harder he works the greater will be the common gain in which he is to participate, and an art-workman might, under such circumstances, feel some incentive to produce excellent workmanship, though we deny that the inducement would be so strong as under a free competitive system; but it is when the numbers forming such a co-operative society are increased to any large extent, that the failure of the socialistic principle becomes evident. Then the importance of individual effort appears so inappreciable that many a man will indulge in partial, if not total, idleness, feeling assured that he will never want food and shelter so long as he remains a member of the commonwealth. This introduces us again to the old objection against socialism, viz., that it provides for supporting the idle and dissolute at the cost of the sober and industrious members of society.

The objections already urged against land nationalisation apply with equal force against the State appropriation of capital advocated by the Socialists. "National banks," we are told, at page 59, "national credit establishments, State and Communal centres of distribution for the purchase and exchange of goods, will supplant and take over the huge enterprises for the gain of a class which now exercises such enormous influence, and accumulates such vast profits under protection of the middle-class State." Without private capitalists, no private enterprise could be organised, and without private enterprise what would become of the arts and sciences? For carrying out novel inventions or great works of art, we presume Government grants would have to be obtained. At present a private capitalist can inaugurate a great scheme at his own peril, sinking his money in the employment of labour until he meets with adequate returns. He thus employs labour at a loss for a time, during which the labourers receive more value than they produce; but no such hazardous investment of the public money would ever be allowed for forwarding schemes of doubtful efficacy. Even the artist, who lingers over his work in order to perfect it to his liking, must live in the meantime on capital in some form. At present he lives upon his own resources. Would he feel disposed to become the pensioner of the State, and would the State-directed career recommended for him by Mr. Morris be favourable to the freedom of originality, or, indeed, to any freedom at all? And how is art to be made cheaper for the benefit of the poor, unless it is to be by underpaying the artist? Our modern plutocrats, though sometimes wanting in discrimination, certainly pose as munificent patrons of art, and it is difficult to see how State control could afford it greater encouragement. Artists,—we use the term in its broadest sense, as comprising not only painters, but sculptors, architects, and others,—occasionally amass large fortunes, and their example acts as a healthy stimulus to competitive exertion on the part of others. Abolish competition, substitute socialism, and we venture to predict that art, in common with all other forms of human activity, would decline, from the lack of all encouragement to individual effort. It is idle to point to the Mediæval handicraftsmen and their works as exceptions to the great principle of competition. At the time when these men were giving their best efforts to the world, they, as a class, were in a transitional condition; for the much-maligned middle class was then actually being formed from their ranks, as Mr. Morris has himself admitted, in the columns of a contemporary journal.*

What then, it may be asked, is to be done? Is art so expensive that the poor can have no share in it, and must it cease to be anything more than the plaything of an exclusive *dilettanti*? We deny that all art is necessarily expensive because its best productions command high emoluments. Beautiful forms may be given to cheap materials with as little expenditure of labour as ugly forms can; and, in fact, in the commonest articles of daily use, in simple chairs or tables, and in kitchen pottery, more and more artistic feeling is displaying itself in cheap forms, and art of some kind is within the reach of the poorer working-class, if they really care for it. If they do not, their appreciation of it, or of any other form of mental activity, is not likely to be increased by any scheme of social reform which is calculated to undermine all self-reliance and independence of character.

NOTES.

THE monument to the late Dean Stanley,—*the* "Dean of Westminster" *par excellence*,—which was this week placed in one of the bays in the *chevet* of Henry the Seventh's Chapel, is a tomb monument in the Mediæval fashion, with a marble recumbent figure of the Dean placed upon a panelled alabaster tomb in a style in keeping with its architectural surroundings: the figure is by Mr. Boehm, the tomb designed by Mr. Pearson. The upturned face is a good likeness of that countenance which was so well known in London; that face at once eager and refined, wearing the expression of one of whom it might be said that whatsoever things were pure, whatsoever things were lovely, whatsoever things were of good report, he thought on those things. Many who have looked at it must have felt the contrast between that active energetic life and the repose of this effigy, sleeping beneath the subdued light of the stained-glass window. The whole is in harmony with the *genius loci*, which unhappily can hardly be said of many of the Abbey monuments, certainly not of Mr. Boehm's Lord Beaconsfield in the north transept. Of course we do not know how far the sculptor is responsible for the choice of the ceremonial dress, little in keeping, and very weakly treated, as is the whole figure; but the countenance is full of point and characteristic expression. Unfortunately, this expression itself is painfully discordant with the associations of the place, and perhaps still more so with the garlands of primroses with which admirers have encircled the feet of the figure; it is as if sneering at the whole affair, as perhaps the original of the monument would himself have sneered; but that is no fault in the sculptor. Longfellow's bust, by Mr. Brock, which we did not mention at the time (for, after being ceremoniously unveiled, it was forthwith "laid up in a napkin" for a season), gives the idea of a man of more solid and robust qualities than that poet of quiet and delicate genius really possessed; it is a somewhat flattering bust, but treated in a broad and sculpturesque style. Nothing could be poorer in design than the pedestal or bracket on which it rests; a flimsy bit of Classicism, stuck, like a child's toy, on the rock-like surface of the great pier of the crossing.

* *Justice*, March 15, 1884.

EVERY one connected with the architectural profession, and many outside of it, will have read with great regret and sympathy the melancholy case of Proceedings in Lunacy in reference to an accomplished architect, the inheritor of a name of the highest reputation in the profession. We have not thought it any part of our duty, or consistent with good feeling or good taste, to occupy our columns with any report of proceedings painful to all concerned, and to which the daily press has given all the publicity which is necessary for safeguarding the interests of society; nor do we feel disposed to comment on a matter of which those most nearly concerned must be the best judges. We beg leave only to express our sincere sympathy with those on whom so heavy an affliction has fallen, and our hope that it may prove only of temporary duration.

WE have received from the "Society for Photographing Relics of Old London," Nos. 85 to 96 of their subjects. These include a delightful old staircase, wide, substantial, unpretending, from No. 10, Austin Friars, as well as a view of the exterior. The old Bell Inn, exterior and courtyard, furnishes two illustrations, the interior buildings towards the courtyard looking like a cloister in the rough, or a survival of an older and more massive stone architecture. The "Old House, Fore-street," stands as a silent commentator on the Fire of London, and the reasons and opportunities for that pyrotechnic display; nor, it must be confessed, has it any architectural beauty and character to atone for its very combustible constitution. A view of St. Giles's, Cripplegate, seen over the houses, serves to remind us how effective general design may be combined with very poor and feeble detail. The "Old House, Great Winchester-street," with its paved courtyard and wide hospitable-looking flight of steps up to the door, is as characteristic of the days of "Old Leisure" as anything could be; and another London characteristic is shown in the bit of green foliage clinging to the side of the old house; for it is remarkable how, in spite of fog and smoke, vegetation clings to the old streets and corners of crowded London: few streets that have not a bit of green somewhere, come upon when you might least expect it. The two doorways at Laurence Pountney-hill are of a more ambitious mood of architecture, brilliant with carved jambs and brackets carrying the ends of the semi-circular stone canopies of the period. "College-street and Innholders' Hall" are in a more subdued and plain style; the door of the hall, shown separately to a larger scale, is a capital specimen of simple largeness of design; not known through any evidence to be Wren's, but looking very like him. Here in the angle of this old narrow street, too, we find the hardy London tree flourishing and overlooking the roadway. A doorway in College-hill, and some old houses in Fleet-street, one of them said to have been the residence of the author of "Polyolbion" (how many "general readers,

know anything of "Polyolbion" now?), complete the tale of the present batch of publications, which form part of a set that every one who loves older London and its multitudinous associations ought to possess.

LORD BRABAZON, in a letter to the *Times* of Tuesday last, drew attention to the project, embodied in a private Bill now before Parliament, for a public recreation-ground for Fulham and Hammersmith. The proposed site lies between the Thames on the west and the Fulham Palace-road on the east, bordered by the Bishop's-walk on the south and Hammersmith on the north, which, with a few deductions, covers an area of some 160 acres, the freehold of which is valued at 230,000*l*. To acquire this property and lay it out for recreation it is proposed that the Metropolitan Board of Works should be empowered to raise the necessary funds at 3½ per cent. interest, which, together with the sinking fund, need not exceed 10,000*l*. a year,—in itself equal to one-tenth of a penny in the pound on the metropolitan rateable value of 30,000,000*l*., and amounting to the very small sum of 2d. a year to each 20*l*. householder. Lord Brabazon urges that, looking to the absolute necessity for open spaces for the health of London, municipal authorities should not wait to purchase until land, being surrounded by a dense population, has acquired a fictitious value, but should buy with a view to future requirements, and points out that America has set an example of acting on this principle. "The Central Park at New York was for many years only central in imagination, being some distance from the city. It is now contiguous to it, and, no doubt, in a few years' time its name will not be inappropriate." If the Fulham site is not acquired now, in a year or two the cost might be increased by 100,000*l*. Two-thirds of the land belongs to the Ecclesiastical Commissioners, who are not hostile to the Bill. The cost is the only difficulty, except the want of statutory powers, which Parliament is now asked to supply.

MESSRS. BELHAM, of Buckingham Palace-road, have had on view at their rooms a stained-glass window, designed by Mr. J. P. Seddon for Llanbadarn Fawr Church, near Aberystwith. The window is a five-light one, showing in the three centre lights a representation of the Transfiguration, the three Apostles below, the Christ and Prophets above, in vesica-shaped spaces, encircled with what we understand was intended as a kind of conventional indication of clouds, the only bit of the design we do not quite like, as they make ragged lines round the framework of the principal figures which are not quite pleasant to the eye. The figures have sufficient freedom of line and action without departing from the degree of conventionalism which is requisite in such a design, both in regard to the materials and the strictly defined spaces into which a mullioned window is divided. The side lights are occupied by angels with various musical instruments, including a kettle-drum, not a sort of instrument we should expect to be prominent in angelic hands; but, as Malvolio says, "there's example for it" in certain Mediæval designs of the same type, which must, we suppose, be held to justify the idea. Apart from this, the window is a fine and original one in general idea and in colour; the effect is heightened (or deepened) by the peculiar thick and streaky-tinted glass employed, which is a speciality with the makers, an attempt to imitate the effect of the old thick horny glass of earlier Mediæval work, where there are no spaces of absolutely crude or flat colour, but everything is shot with varying hues and tones, some of these inherent variations in the glass being even arranged so as to supply the idea of the drapery folds. The nearly white glass employed for most of the drapery of the principal figure causes it to shine out from the rest, heightening the idea of the Transfiguration.

AN exhibition of work in precious stones and jewelry of all descriptions is to be held in Paris in August of this year,—an exhibition which, if properly carried out, ought to be a most fascinating as well as an artistically instructive one. Some discussion has arisen, according to the *Gazette des Architectes*, as to the question whether the mounting of the jewels should be taken into account in judging of the merit of the exhibits, the syndicates of diamond-workers and jewellers having represented to the "Union Centrale des Arts Décoratifs" that there would be some difficulty in inducing jewellers to submit only unmounted stones. It has accordingly been decided that precious stones, gems, cameos, intaglios, or mosaics, will be accepted either mounted or unmounted, but that the mountings will not be taken into account in awarding the prizes. The exhibits will be classified as follows:—

1st and 2nd Groups.—Jewelry in all its applications, precious stones, and cameos.
3rd. Bijouterie in precious metals, and imitations.
4th. Goldsmith's work in its various applications.
5th. Artistic bronzes and imitation bronzes.
6th. Enamels on precious metals or cloisonnés.
7th. Coins and medals.
8th. Watches and other analogous work.
9th and 10th. Various objects ornamented with precious stones, and accessories of art-industry.
11th. Crown jewels and exhibits from the State collections.
12th. Special objects not coming under any of the above groups.
13th and 14th. Various objects to be executed before the public by workers in the various industries included in the exhibition.

WE print in another column a communication of some interest, arising out of a review of a work on military architecture in our last, giving the opinion of a military authority as to the part which the architect might, and indeed ought to be invited to, take in the planning and designing of modern military structures. How many of Colonel Parnell's colleagues would subscribe to his opinions we cannot at present conjecture; but it would no doubt be satisfactory to architects to find themselves invited to a new field of labour of great interest and honour. As to Colonel Parnell's own objection to our statement that the architectural element has died out of military structures, we do not think there is anything in his description of such structures, as existing, to controvert it. That there is much stone work masked behind some earth-faced fortifications does not of necessity render them architectural in the sense in which we used the term. We alluded to the fact that ancient fortifications had, though not intentionally, a distinctly picturesque architectural element, which modern fortification works have not, and we imagine most of our readers will think the dictum only too true.

FEW people unconnected with it have heard very much of the "International Exhibition" at the Crystal Palace, but it appears that there is, at all events, to be an "opening day" on Wednesday next in great form, and auguring something on an important scale. The Lord Mayor is to preside, and the members of Her Majesty's Government, as well as many Ambassadors and distinguished men, have been invited. Sir G. Macfarren has composed a cantata for the occasion, in which Mesdames Albani, Patey, and Antoinette Stirling, and Mr. Santley will take part. The exhibition will include a great variety of objects of interest; naval architecture is to be largely represented by many models of the finest examples of modern shipbuilding; but the international character of the exhibition will be most illustrated in the art department. East, West, North, and South, we are told, are to be represented; a great bronze vase from Japan will vie with a great porcelain vase from Staffordshire. Etching and engraving are to be largely illustrated, and the walls of the exhibition will be rendered further attractive by a remarkable display of the publications of the Vienna Society, the Bond-street Fine Art Society, and other art publishing agencies. It is a good while since any art, except that of music, has been really well represented at the Crystal Palace, so that we hope the promises made will be realised; though it may be thought that just at present we are becoming a rather over-exhibitioned people.

"MY own romantic town," as Scott called Edinburgh, has been in a state of unusual excitement and stir this week, in the celebration of the tercentenary of its University. The streets have presented an unwonted aspect, the usual pedestrians in homely broad-cloth being interspersed with individuals in robes of black, white, scarlet, and yellow, with hoods of all the colours of the rainbow, and the collegiate trencher has had the best of it over the ordinary British hat. Alas! why cannot we be always picturesque? Every city, it is true, does not present such a scenic background as Edinburgh, and the inhabitants of the city flatter themselves that the wise men who have come from all quarters to assist at the celebration will not forget the effect of Auld Reekie as seen under these exceptionally favourable circumstances. The Edinburghers are more careful of the picturesque, too, than the natives of some other cities. They show a laudable desire to avoid spoiling their city more than can be helped; as instanced in the picturesque new houses at the Lawnmarket, designed by Mr. Marwick, to replace some old timbered houses which had to be removed owing to decay. The University is about to show its sympathy with architects by conferring on Mr. R. Rowand Anderson, the architect of the new medical class-rooms attached to the University, the degree of LL.D.

FROM an amusing article by M. Planat, in the last number of *La Senaine des Constructeurs*. it seems that there is a kind of "Anti-scrape Society" dispute going on about Mont St. Michel. The actual state of the case is too complicated for our contemporary to make out; but it appears that some people who are stigmatised as *utilitaires*,—an epithet which, as M. Planat justly observes, proves nothing,—wish for a dyke from the mainland to the Mount, above the reach of high water, and that others of the archæological purist party oppose the project on various grounds. Mixed up in the controversy are "Messieurs des Monuments Historiques," as they are irreverently termed, a certain critical "bas-Normand," and a mysterious "Société des Polders," who profess to have rights in the matter which no one understands, and which they do not define, but who obtained a gold medal in the Exposition of 1878 for a project for draining dry St. Michel Bay, between two dykes, which were to act as barriers to the sea. The defenders of the *status quo* maintain that the formation of the dyke has disturbed the foundations of the ramparts, and that great cracks are appearing in them but no two parties can agree as to whether the appearances so named are really cracks. M. Vachon, an "anti-scrape" correspondent, after premising that "Mont St. Michel est une merveille," a statement which *La Semaine* is not disposed to contest, declares that the works that are being carried on will have disastrous effects, and that he gives one particular tower just a year to stand. On the other hand, constant communication with the main land is urged as a work of charity to the 100 inhabitants of the island, to prevent their being drowned by the tide, smothered in the mud, or dying for want of access to a doctor. As to the tide, replies M. Vachon (almost in the very terms of Dickens's engine-driver), only seven people have been drowned in crossing during sixteen years; and as to the other points, comments "le bas Normand," "faut-il beaucoup s'apitoyer sur cette mauvaise habitude qu'auraient contractée les pauvres habitants, de se noyer dans le fange?—Sur l'absence des médecins? Plus d'un mauvais plaisant y trouverait plutôt matière à rire." But there is a further complication. The Mount has a gateway: now people used to go up from the beach to the gateway, but now they have to go down from the dyke on to the beach and up again. Then carry the dyke on to the gateway. But the gateway is lower than the dyke,—indeed, it is submerged at high tide, while the dyke is "insubmersible par destination." Then make another gateway at a higher level. "Relevez la porte! Et le style de l'époque! Et l'intégrité du monument? Et l'authen-

ticité de la porte, qu'en faites-vous? Une porte neuve, dans le mur sacro-saint du Mont! Et de quel style, s'il vous plaît, votre nouvelle porte? Les uns, conciliants, auraient concédé une porte gothique. Vraiment! disent les autres narquois: du pastiche, toujours du pastiche! Messieurs des Monuments en ont trop usé et abusé; nous n'en voulons plus," &c. The question seems to be still unsettled; but there is a certain wicked satisfaction in finding that our neighbours are tarred with the same brush as ourselves.

THE DECORATIVE USES OF METALS.*

Of Bronze.—The treatment of bronze should be as different from that of forged iron as darkness from light. Its sombre colour, its imperishable nature, and its intrinsic value, combine to invest it with unapproachable dignity. Its sterling and enduring character fit it beyond all other substances on earth for monumental purposes. Compared to even the hardest syenites and granites, it would endure for ever, for how can these be expected to withstand the tempests of ages when carved into monuments, while we see the vast upheaved ridges of their native mountains weathered and fretted into pinnacles and *aiguilles*, mere shreds of their former masses, while in England we have stumps of old mountain chains, now weathered away to a few hundred feet high, which formerly gave birth to rivers and torrents equalling those that flow from the Alps? Works in bronze should always be dignified and somewhat massive in character. It is unsuitable for small objects, and its treatment should never be finicking or grotesque. For monuments and effigies it is unrivalled, and we may almost say that the only ones that have come down to us uninjured are of bronze. No bronze effigy is defaced or has required restoring. If all our kingly effigies had been of sculptured bronze, we should be in possession of a portrait-gallery of surpassing interest, in place of the scraped and restored stones of St. Denis, or of the defaced ones of Westminster. There is far less, however, to be said in favour of bronze for internal monuments, where marble is at home, than for out-door monuments, where its superiority is absolute and incontestable. Apart from the fine examples of bronzes already mentioned, some of which, at Hildesheim and Lübeck, have braved 800 years of Baltic climate, or Trajan's column or the horses of St. Mark's, whose antiquity is reckoned in thousands of years; there is just outside Nuremberg a campo-santo in which every tomb is of bronze. They are all similar in design, and consist of a slightly curved slab with armorial bearings in relief. Some of them bear dates of the fifteenth and some of the nineteenth century, yet, except for a little stiffer treatment of the mantles in the older ones, there is nothing to distinguish the newest from the oldest. No more forcible proof of the absolutely indestructible nature of bronze when exposed to the weather could be wished than this; yet, though the only material capable of resisting London air, where is a bronze tomb to be seen in a metropolitan graveyard? What sums are lavished on the puny obelisks, the broken shafts or stereotyped urn and drapery which form the more ambitious monuments in a British cemetery, and how far superior the Nuremberg plan! If stone must be used, might it not more advantageously take the form of colonnades inclosing campo santos, the slabs and bases of the columns receiving the inscriptions? Grand effects, such as those at Pisa or Genoa, could be produced at less cost than is now expended in isolated efforts.

Our campo-santos might be appropriated to artists, to heroes, to sages, to goodly merchants, and the architecture infinitely varied. To return to bronze, however, we cannot help noticing how extremely limited in London is its use, there probably being in existence not more than some half-dozen bronze lamp-pedestals, and but few drinking-fountains, and only one pair of gates, those under the Marble Arch. Of portrait statues we have to spare, and it is to be regretted that some other form of memorial is not more frequently used in their stead. Whether sitting or standing, our nineteenth-century costume does not lend itself to statuesque dignity and repose, nor to heroic action. It is always surprising that memories of those whose good deeds have not been national enough to deserve a public statue, are not often commemorated by less pretending memorials, such as fountains, lamp-posts, crosses, vases, tablets of bronze. We have no reproduction of the Venus de Milo, the Diana, the Apollo, or in fact of any good antiques in London public places, yet their cost as memorials would be relatively very trifling. The Irish Celtic crosses are magnificent objects, as well as sacred emblems, and the Japanese have shown what dignity storks, pelicans, and eagles assume when treated on a colossal scale. Winged lions, lambs, angels, and many other forms are intrinsically beautiful, and have a religious significance, and are, therefore, adapted for memorial use, and would look well if raised to a sufficient height. But apart from such purposes, bronze has a high architectural value, and might be largely used for the caps and bases of granite shafts, panels, the filling in of spandrels, and occasionally for doors, and even gates and railings. It is far less expensive than is supposed, and there is abundant precedent in Italy for its use for all these purposes.

Bronze is a mixture of copper and tin, and sometimes lead, the proportions of which vary somewhat, but are usually as nine to one. It is often adulterated with zinc, but when this is the case its surface honeycombs on exposure. Although it can be chiselled into form, the only practical way is to run the molten metal into moulds prepared of sandy loam, but the surface of the rough casting can afterwards be chiselled or chased into any degree of fineness desired, and in the smaller French bronzes even the texture of the skin is reproduced. Its natural colour is a fiery red, but under our skies it rapidly tones to a deep brown. The greatly prized green and rich brown patinas are produced artificially by powder or pigments, or exposure to the smoke of burning wood, but they result naturally from slow chemical decomposition acting for a long time, according to the conditions under which they have been preserved.

Though exceedingly tough, bronze is not very malleable, and when required in plates or small rods pure copper is substituted. This also rapidly assumes a pleasing hue, generally a whity, beryl-like green. Those who know Copenhagen must recollect the beautiful effect of the fantastic steeple, formed of twisted dolphins, ensirely sheathed in copper, and the still more beautiful spires of Lübeck.

Of Cast Iron.—Cast iron should be used in exactly the same way as bronze, of which it is a cheap substitute, and it is only really artistically admissible when used, as in the facings to Westminster Bridge, on a scale that is colossal. The lamp-posts on the Thames Embankment are very favourable specimens of it, but it is questionable in so costly an undertaking whether bronze should not have had the preference, for their liability to damage and the cost of painting them from time to time will eventually reduce the original economy to nothing. The saving is, at most, the difference in the intrinsic values of the metals, the cost of moulds, &c., models being identical at the outset. Cast iron is, however, in most cases a sham that should be banished for railings, balconies, balusters, and all purposes where lightness combined with strength is required. The increasing demand has already shown that wrought work competes successfully with cast, even in mere first cost, as it will ever do if designers will but bear in mind that plain and simple iron-work is more in keeping with the simple architecture of inexpensive buildings, and is in better taste than the absurdly ornate little balconettes and crestings that deface almost all our suburban terraces and cottages. Cast iron is an unnecessary sham when it essays to reproduce forms proper to wrought iron, while its brittleness should, from a utilitarian point of view, lead to its use being utterly abandoned as a substitute for smith's work. The railings to the gardens of the Thames Embankment are a case in point, for they are so broken and snapped that it was proposed at a recent Cantor lecture* before the Society of Arts to secure a panel, if one yet remained perfect, and place it in a Museum. Cast iron has its uses, but its treatment should be more solid and massive than that of bronze, and, in no case should it imitate wrought iron.

Of Brass.—Brass, from its composition, can only be used in the interior of buildings, and should not be exposed to damp. Its natural pale yellow colour is very agreeable, and is due to the presence of zinc. It is not highly malleable, but may be cast and treated like bronze, or by a process of annealing rolled into thin rods and sheets, and worked up in the same way as iron. It is difficult to give a decided preference to either method, though they are so totally opposed in principle and practice. The present tendency is in favour of wrought brass, welded, beaten, pierced, hammered, and riveted as in iron; for this exhibits the individual skill of the handicraftsman, and possesses a sentimental value that cast work, which can be reproduced *ad libitum*, cannot possess. The designs should be more severe and precise than if intended for forged iron, and more pierced and embossed work should be introduced. It should be sparingly used, and the redundancy of polished brass in some of the newest restaurants in London, though affecting to be of the quiet and unpretending style painted by Hogarth, is vulgar.

The works in ormolu of Louis XV. and Louis XVI., which are of cast and chased brass gilded, are too beautiful to afford any scope for adverse criticism, but objects designed to be cast in brass should either be of great delicacy or of great simplicity.

Though the arts of working, in at least what are called the baser metals, are not yet in the position their importance in the past and in the present entitle them to, the future is full of hope, and we may trust that a time is at hand when men of exceptional power, though engaged in what have been regarded as the humblest industries in which art can enter, will be able to impress the seal of genius on their work, and hand names down to posterity which may no more be forgotten than those of Peter Vischer of Nuremberg, Quentin Matsys of Antwerp, or Shaw of Nottingham.

OLD TOOLS.

No one can reasonably complain that the Old World has not of late been afforded very ample means of acquiring a vast amount of information respecting America. We have had placed before us a most varied series of impressions as experienced by a crowd of amateur travellers and "globe-trotters," poets, theatrical and other "stars," M.P.s, philosophers, and novelists, who have each and all freely imparted their views through the press and the circulating-libraries. In all this flood of information there has, however, been a want of a practical point of view respecting a country from which no one returns except with his eyes opened as to questions of the utmost interest, even to our venerable civilisation.

Something of this practical element may be said to be supplied by the evidence recently gathered by the delegation despatched from Paris some months since to the Boston Exhibition, and which, composed of seventeen carefully-chosen members of the more important mechanical trades followed in the French capital, has fulfilled its duties in a manner which, now that the delegates have delivered themselves of their general impressions, has brought them a vote of thanks from their fellow-workers.

The views of these "citizen delegates" despatched to America, at the expense of their fellow Parisian workers, are deserving of attention at a time when the question of American competition is placing itself before the world as a factor of growing importance. As can be imagined, the political element has not been wanting in the verbal reports of the Parisian delegates, though this may for our purpose be dismissed by the statement that the experience of the party generally showed them, in a land of promise so often held before the European workman, almost all the same industrial difficulties that exist on this side of the Atlantic, and arising from the same unsatisfactory regulation of the relations of capital and labour; the concensus of opinion tending towards the frank admission, —sincere, too, it must be remembered, coming from a source so purely "ultra,"—that the workman was, after all, better off in France, and therefore it may be said in Europe, than in the States.

Important as is this conclusion, it is to a more directly-practical point of the delegates' report that we would wish to draw attention. There

* See pp. 471, 504, *ante*.

* By Mr. G. H. Birch. (See *Builder*, vol. xliv., p. 532.)

is a unanimity of opinion as to the superiority of the tools used in every mechanical trade in America, their great perfection, their adaptability to the daily changing needs of commerce, the saving of hand-labour they insure, and the consequent economy in the price of production. In this direction France, it is frankly admitted, is sadly behind, not only America, but those European nations which, having entered the competitive field more recently, are supplied with more perfect machinery, and tools better fitted to supply the demands of modern commerce. The question, in fact, of the simplicity, the imperfection, of their old tools, has at length roused the attention of the French workmen. And here a further light has been thrown upon the subject by the evidence of the Commissioner despatched to America by the French Minister of Commerce with a view to furnishing a report upon the trade of the United States. A lecture delivered by M. Lourdelot on his return a few weeks since, entirely bears out the similar experience of his own countrymen on their similar but privately-subsidised committee of inquiry. The development in all the great American cities of branches of trade for which, till within a few years ago, our cousins were solely dependent upon Europe, is now amazing, and in every case American intelligence has introduced improvements into the machinery used. Upholstery, cabinet-making, silk-weaving, bronze-founding, jewelry, artificial flower-making, branches of trade, it can be seen in which a large share of art is absolutely necessary, are all actively pursued in New York. The models are European, it is true, the workmen European also; but the rest is purely American, particularly all the numerous applications of machinery. One feature is especially worthy of notice; when it is felt that a workman has lost his delicacy of hand he is sent back to Europe for a year or so to get his hand in again.

But the chief element of competitive danger arises from the superiority of the tools and machinery used, the admirable management of the workshops, and the consideration given to many other details too often neglected on this side of the Atlantic. The conditions of commercial production having so completely changed within the last generation, it can be understood what an important element this feature constitutes. It is freely admitted that it is the superiority of their machinery quite as much as their large supply of raw material which enables the Norwegians to export to the rest of Europe at such low rates their ready-made doors and windows. To take one typical branch of trade,—the old-fashioned bench, the few regulation tools, the glue-pot, and the set of primitive cramps used in the innumerable unhealthy little workshops not only in Paris but in London, suited the needs of the past, but are utterly inadequate to cope with the necessities of the present.

Much as we may "rear up," to use an Americanism, against the invading influence of competitive commerce; much as we may deplore, from an artistic point of view, its fatal effects, our acquaintance with the laws of evolution show us that these are some of the inevitable consequences of that struggle for existence,—of that fundamental principle of the survival of the fittest,—which is now so universally accepted as that of the progressive development of our race. America, which has taken up the subject of its commerce in the practical spirit with which it approaches most questions, will, probably, be the first to solve what so far appears to justify the fears of those who claim that the demand of art must suffer by the competitive direction of modern commerce. With that shrewd absence of prejudice which enables them to approach impartially the consideration of subjects on which we, of the Old World, have made up our minds, our "kin beyond the sea" have not by any means neglected the art-side in the development of that commerce with which they dream they will not only be soon able to stand independent of our help, but even supply our markets.

In the meantime, while in America they are endeavouring in every way to increase the efficiency of their art schools and their art training generally, they have seen the large field which lies open for the exercise of those inventive faculties for which we have at all times been so ready to admit the superiority of our "Yankee" cousins, and this field has been well worked in the direction of an improvement of what tools are necessary in the workshops. It is a problem we would rather leave to the discussion of the politicians and the socialists how far the extension of the application of machinery to work so far done by hand has been more directly profitable to the workman, either pecuniarily or intellectually, this latter feature being, perhaps, the most important of all, from the leisure machinery should procure to the working classes. But unquestionably, whatever may for the moment be the results of these radical changes in the conditions of commerce, the advent of America and American industry is creating a sensation which has already caused some of the older nations to "sit up." Under such conditions we must not repose undisturbed; we show, in fact, in many ways, that we are far from indifferent. Our old tools must be replenished, renewed, and in many cases set aside; and amidst our old tools may be ranged many old "saws," many old precepts, many old principles, many old traditions, which, though they may have worked admirably till now, are not calculated to stand the strain of an entirely new series of conditions.

THE GARDEN, CLIFFORD'S INN.

"In the garden, an airy place, and neatly kept, the gardens being enclosed with a palisado paling, and adorned with rows of lime-trees, are set grass plats, which have a pleasant appearance, intersected by gravel walks." So writes Maitland in his "History of London" (1739). "This land to let [*sic*] on building lease," say the owners of the freehold on a board which they have just set up in the old Garden, Clifford's Inn. The garden, adjoining that other which takes its name from having formerly been part of the Rolls House area, retains but few features to merit Maitland's encomium; but it is a grateful refuge, nevertheless, and can be ill spared for the objects proposed.* It lies between the hall, to the south, and a modern block of buildings known as the Judges' Chambers; these latter are now occupied by the Record Office for the sorting, binding, &c., of State papers. Eastwards stands a set of chambers, Nos. 15-17, one of the oldest in the Inn. In a garret here the subject of one of Jack Bamber's choicest stories committed suicide, as related to an admiring audience, including Pickwick and Lowten, at the Magpie and Stump. On the pavement-flags below passed a memorable interview between John Rokesmith and Boffin.

Clifford's Inn, as an inn of Chancery, appertains to the Inner Temple. Its origin dates from a period remote. It had been a residence of the barons De Clifford, ancestors of the earls of Cumberland, and themselves descended from Walter Fitz Ponz, who, by his marriage with Margaret, daughter and heir of Ralph de Toeni, of Clifford Castle, county Hereford, was father to Fair Rosamond. In a grant of 24th February, 3rd Edw. II. we read:—"The king granteth to Robert Clifford [son of the great Roger de Clifford] that messuage with the appurtenances next the church of St. Dunstan's-in-the-West, in the suburbs of London, which messuage was sometimes Malculines de Herley, and came to the hands of Edward I. by reason of certain debts which the said Malculines was bound . . . to our said father . . . which house John Earl of Richmond did hold at our pleasure, and is now in our own possession," &c. This grant was held by one penny's service, payable at Michaelmas. Isabel, Robert's widow, let the premises, 18th Edward III., for 10*l.* a year to students of the law, who, in the record, figure as *apprenticii de banco*. By some means the property reverted to the Crown, and then again to the Cliffords. Eventually it became a permanent settlement for lawyers in virtue of a grant in fee-farm to Nicholas Sulyard, principal, and bencher of Lincoln's Inn, with others the seniors, for a sum of 600*l.* and a rent of 4*l.*, temp. Henry VI. We are here reminded of William, son of Francis Sulyard, Bedchamber Usher to Henry VIII., to whom Robert Sherborne, Bishop of Chichester, leased Lincoln's Inn. The modern Gothic hall standing just northwards of St. Dunstan's Church, carries over the passage the initials and date P. W. M., 1767. In the windows is some good old coloured glass. In the thoroughfare between the buttery and screens and elsewhere may be seen the armorial bearings of the house,—chequy, or and azure, a fess gules, besanté sable, within a bordure of the third. The hall is chiefly notable as being the place where sat Sir Matthew Hale with Sir Orlando Bridgman, then Lord Chief Justice of the Common Pleas, and the other Judges, to adjudicate upon the multitudinous conflicting claims between landlord and tenant after the Great Fire. So satisfied were all parties with their discharge of this grave office that the Corporation ordered the Judges' portraits to be painted for the Guildhall. Coke (1571) and Selden (1602) were admitted of Clifford's Inn. The regicide Harrison served as clerk to one Thomas Houlker, whom Clarendon calls Hoselker, an attorney here. Sir John Bramston says in his Autobiography that Harrison persuaded his fellow clerk, John Bramston, to take arms against the king. Clifford's Inn too is the reputed home of Robert Poltock, author of the one successful imitation of De Foe's story, namely "Peter Wilkins."

* Its sorry condition until recent years was probably due to the periodical inroads of a mob who would run riot all over the ground to share a dole, in kind, which used to be distributed here at the beating of the parish bounds.

MILITARY ARCHITECTURE.

Sir,—Will you allow me to make a few comments on your interesting article [p. 502] on this subject, written with reference to the recently-published important work of Mr. G. T. Clark? As a genial opponent, you have already had occasion to notice my views on physical subjects; but I trust that twenty-six years of experience in regard to the matter on which I am now addressing you will be some excuse for my wish to occupy again a portion of your valuable space.

Your article commences thus:—"Military architecture, as a living art, has long ceased to exist." I am afraid, sir, that this *dictum* must bring me at once to close quarters with you. I think that, on a more detailed examination of the science and art of what is known at the present day as "permanent fortification," you would be inclined to agree with me that this branch of construction differs but little in principle and in practice, only in degree and detail, from the military architecture of the later Middle Ages. Further on, you say, "the old line of ramparts is succeeded by detached earthen forts "scarcely distinguishable from the upland meadows from which they rise like great ant-hills." Now, in respect of the landward portions of modern permanent fortifications in England, this latter passage gives a very good idea of the *appearance* of these isolated forts. But, if you were to see the plans of one of these forts, I think you would be more apt to speak of them as detached *masonry* forts. For, with the exception of the earthen fronts of the ramparts, these works are simply masses of masonry. The escarps, flanking caponiers, with the numerous galleries leading thereto, the countermines, the casemates for the troops, the tanks, the magazines of all kinds, the shell-stores, the foundations and racer curbs for the gun platforms, and the covering vaults for the guns on the ramparts, are invariably of masonry; and so are usually the inner revetments of the ramparts, the equipment and supply stores, the gorges, and the counterscarps of the ditches. None of these forts in any country consist of the "simple ditch and earthen mound," to which you say permanent fortification is now reduced. And even in regard to the so-called "earth" of the ramparts, this material is, in reality, in nine cases out of ten (for forts are usually built on elevated and more or less solid sites) broken rock from the excavations, unsuited for building material. Again, you mention the "re-adoption" of the "simple ditch," as if ditches had not (as a rule) formed integral portions of Mediæval works; but I think you will find that this was actually the case. It is certainly true that, since the time when artillery was completely introduced into the art of warfare, the object of the military architects and of the military engineers who superseded them has been to *sink* the whole construction as much as possible in order that it should not present an unnecessary target to the deadly fire of artillery. And those portions which could not be concealed, such as the fronts of the ramparts, have certainly been built with excavated material of a nature less damageable by shot and less splinter-producing when struck than was the masonry of those days. But I think this change may be looked upon rather as a necessary adaptation of the art of the military architect to meet changes in the arms in use than as a wholesale obliteration of his

art. Again, ever since the days when artillery fire was first known, the *principal* aim of the military architect (and this profession appears to have been more or less recognised till nearly the beginning of the eighteenth century) was not "to resist his enemy by sullen masses of inert masonry," nor to delay his foe by sunken obstacles, but to provide such an excellent emplacement and disposition for his guns, that their fire should either be unsubduable, or that it should necessitate great efforts and delay on the part of the besieger to crush it by a superior number of his own guns, converging their fire upon it. You also say that "the rifle and the spade are henceforth to be the soldier's twin weapons of offence and defence, and the Moncrieff pit is the modern antithesis of the Norman keep." But, sir, at the present time artillery fire is more than ever the instrument in which attackers and defenders put their trust. In a regular siege the rifle is almost nowhere. And the allusion to the "Moncrieff pit" is hardly appropriate, for these emplacements are employed solely for the mounting of the heaviest kinds of defensive ordnance.

In reference to your mention of "detached forts," as constituting the land fortifications of the present day, there is no doubt that the inland material defences of our dockyards do practically consist of these works. But it would be a gross delusion to imagine that they are the main defences of these great naval establishments. It is thoroughly recognised on the Continent that these rings of forts constitute merely "fortified camps," and that the main defence of the place consists in the masses of troops (in fact, in the *army*) which is needed to guard the *intervals between the forts*. These intervals vary principally according to the funds at the disposal of the military engineers. At Pembroke Dockyard the land defence consists of *one* small fort, and all the rest is interval. This fort I had the honour of constructing (in part) during the years 1866-7. At Plymouth there are comparatively (to Pembroke) small intervals,—that is to say, the two biggest are about eight miles and three miles in length, respectively. I do not, however, wish to pursue this particular phase of the subject; I would only add that for several years before I left the corps of Royal Engineers (which was in last July) I wrote as strongly as I could against this vicious and misleading system of detached forts; that the officer who constructed most of the Plymouth forts (the late Col. C. C. Owen, C.B.) wrote against them eighteen years before I did, with equal vigour and equal ill-success; and that their employment is by no means a necessity in modern permanent fortification. Nothing has yet been adduced by the military engineers who conceived them to prove that the advent of rifled artillery should (as practically it did) involve the supersession of the continuous lines of rampart and ditch which had till then been everywhere adopted.

In regard to the question of the disuse of the term "military architecture," I think it will be found that the gradual disappearance of "military architects" was the principal cause. These men were generally civilians, especially before the seventeenth century; and the gradual introduction into the services of the various monarchs and republics of "military engineers," men whose original *métier* was principally to *undo* the work of the military architect, *i.e.*, to devise and apply machines and arrangements for attacking and capturing their strongholds, apparently led to these engineers being employed as constructors and designers of the works they knew so well how to destroy. The arrangement was probably an economical one; and the old military architects by degrees became extinct. About the same time the French term "fortification" superseded that of "military architecture," and engineer-designed fortifications became, under Vauban's deadening sway, the military rule of the day. I am, however, one of those military engineers who, so far as the designing and construction of permanent fortifications are concerned, are proud to look on themselves wholly as *military architects*, and as the successors of those celebrated military architects who may be said to have remodelled and almost recreated the art of military architecture after the employment of artillery had become general. Modern permanent fortification is practically the development of the designs of the great painter, engraver, and military architect, Albert Dürer, who wrote about 1527, and perhaps also of one of his successors, Daniel Speckle, who was also a civilian military architect. I am decidedly of opinion that the employment of engineers in the designing of what are really architectural, and not engineering works, has been most prejudicial to the art of military architecture. Originality has been almost stifled. Unless, perhaps, it is the French engineer, Choumara, I cannot recal the name of a single military engineer who has essentially advanced the science or art of military architecture. I am far from saying that no military man has advanced it; for no one, probably, has taken a more energetic and skilful part in modernising and improving Dürer's ideas than Marc Réné de Montalembert, a general of cavalry, whom the French military engineers opposed with all the bitterness and animus with which the possessor of any close borough or snug monopoly might reasonably be supposed to be inspired. During Montalembert's lifetime he was looked on rather as a sort of charlatan than otherwise, and he met with no gleam of success. Now, every nation in Europe, and especially the French, are adopting his principles (*i.e.*, those of Dürer), and are throwing overboard the complicated bastioned system, which, thanks to the influence of the French engineers Vauban and Cormontaigne, reigned so long. Again, Rimpler and Coehorn were certainly possessed of originality, and especially Rimpler; and these architects were both soldiers, though not engineers. But Dürer, Martini, Castriotto, Marchi, Speckle, Freitag, and Mandar, all leading names in respect of originality in military architecture, were civilians, and so were many others whom, within the compass of the present letter, I cannot bring to notice.

But even in these days the civil architects of Great Britain have not been wholly unrepresented in the sphere of military architecture. I allude to the well-known architect, James Fergusson, who, in 1849, put forward his views on the subject, and submitted a paper to the Royal Engineers, which, I regret to say, was refused publication in their "Professional Papers." There is considerable originality in Mr. Fergusson's ideas, and if he had only possessed at the time a more complete knowledge of technical arrangements, his proposed system would have been of much value. Even as it was, his ideas on the defence of England, persistently placed as they were before the public, resulted in his being chosen by the War Minister of the day as a member of the Royal Commission of 1860, to whose proposals we owe our present defences. Now I do not at all see why civil architects should not be invited by Government to take up the study of military architecture, and to endeavour, by competition or otherwise, to obtain employment as military architects. As I said before, what we call permanent fortification is simply ordinary architecture under certain military conditions; and those military conditions consist in the designing architect having an adequate knowledge of the powers, dimensions, and equipments of the arms in use. It is by no means essential for the possession of this knowledge that the designer should be a military man. I think that British military architecture (if I may now be allowed to use this most reasonable expression in lieu of that of permanent fortification) would be immensely advanced by the new ideas and by the original light that would be poured on the art if it were thrown open to the whole body of the architectural profession. The design and erection of architectural works, whether civil or military, is of a purely peaceful nature. Military architecture is, in fact, a peaceful art, whatever military engineering may be. In connexion with this proposal of mine to liberate military architecture from its present engineer monopoly, perhaps you will allow me to mention, in regard to (so to speak) the *converse* side of the question, that I am at this present moment attempting to apply the experience I have gained in military architecture to practice in the civil side of the profession, and that I have recently formed one of that devoted band of 120 men who sent in competition designs for the new War Office, but unfortunately did not succeed in impressing the judges with their merits.

Before I close this letter, I would like to mention that, in regard to the use of earth for portions of fortifications, in 1877, whilst at Gibraltar, I had the honour of designing (not adapting a sealed pattern design, as is the usual practice at the War Office, but actually designing) the purely landward open battery known as Princess Caroline's, and wholly of that durable material (the material *par excellence* of the modern military architect) known as Portland cement concrete. This battery was erected under my supervision, and it displaced an old one on the same site which was built of earth (so-called) revetted with stone. I mention this as an instance that in at least one great European fortress, the land batteries have not all of them even an earthen front. I designed several other new batteries at this fortress with the same material, but these were all coast batteries. And this brings me to the subject of coast military architecture, which your article appears to have overlooked. The great majority of modern coast batteries for the heaviest guns are, in these days, almost invariably built either wholly of masonry or chiefly of masonry and partly of iron. A cursory inspection of the coast defences of Portsmouth, Plymouth, and Pembroke would satisfy any one on this score. Iron is rapidly becoming obsolete, chiefly on account of its prodigious costliness, and simple Portland cement concrete open barbette batteries are rapidly becoming the order of the day. It must be understood that the objections to the use of ordinary masonry in landward works apply with more force than to its adoption in coast works. But for all kinds of works Portland cement concrete has qualities greatly superior to any sort of stone masonry, brickwork, or earthwork. It does not splinter when struck as the two former do, it disintegrates far less when struck, its toughness and homogeneity are greater, and it is practically much cheaper. It is, moreover, far more adapted for casemates and bombproof constructions generally. In comparison with earthwork, Portland cement concrete cannot be blown to the winds as is done when a large siege shell buries itself in an earthen front and then explodes, and a parapet of Portland cement concrete actually needs far more battering by a land attacker's guns to render it unserviceable than would a parapet of earth at least three times its thickness. I feel convinced that the military architecture of the near future, in respect of landward works, consists in the entertainment of this material for all the more exposed portions, such as the ramparts, and in a return to the old *enceintes*, modified, when rendered necessary by reasons of economy, by breaking up the continuous rampart into inner detached batteries, but leaving the ditch or obstacle in its continuous state.

I have not as yet had the pleasure of reading Mr. Clark's work, but I certainly think that it appears very opportunely. I am unaware of any researches in Mediæval military architecture that have ever been made by military engineers, and this book goes to show that much light can be shed on military subjects by other persons than trained military men.

ARTHUR PARNELL,
Colonel (late Royal Engineers).

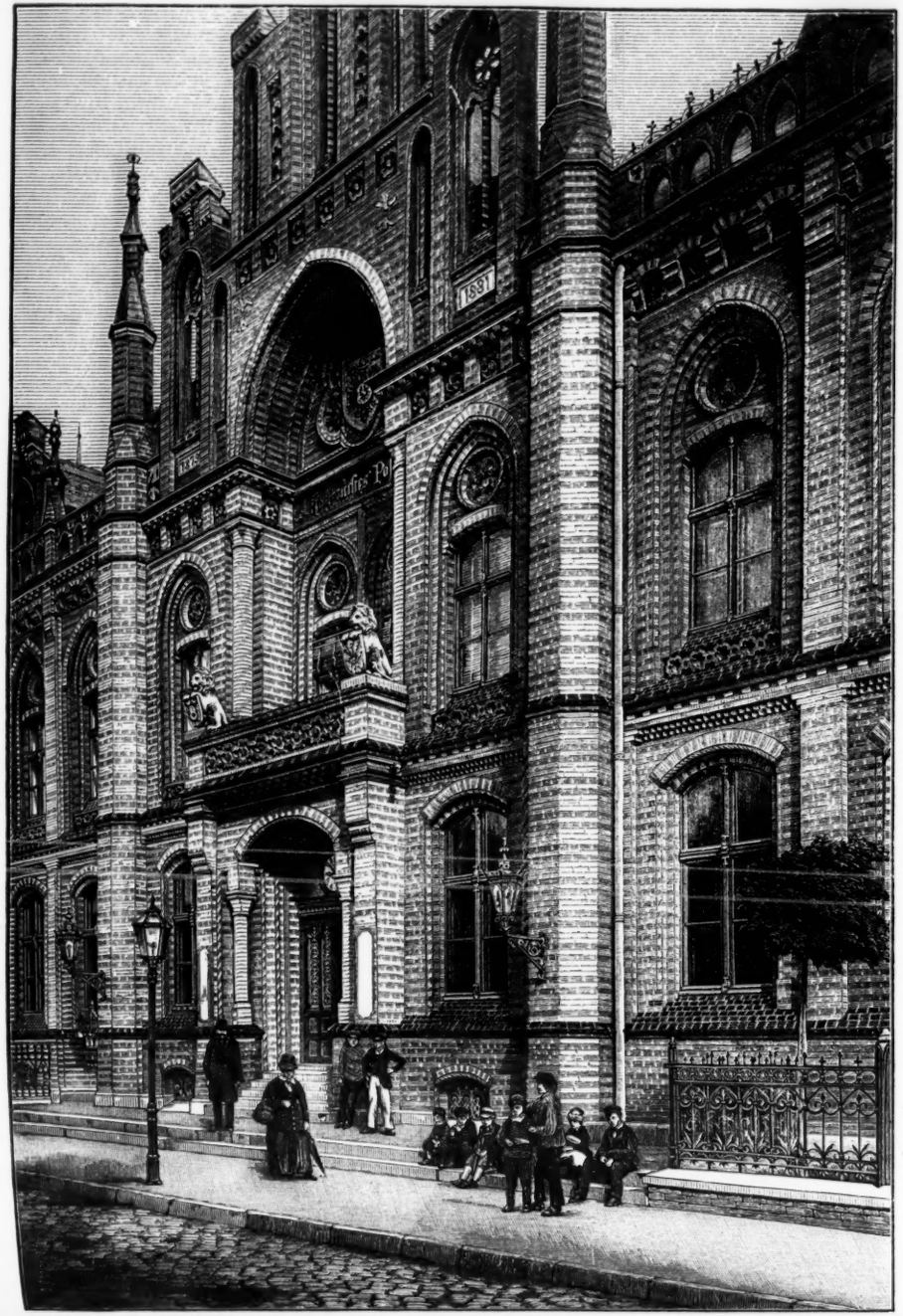
Newcastle-on-Tyne, April 12th, 1884.

NEW POST-OFFICE BUILDINGS, ROSTOCK, MECKLENBURG.

THE German Government have been doing a good deal in the way of Post-office building lately, mostly in the Renaissance style, which is much more practised and, we may add, much better understood in modern Germany than anything allied to Gothic art. But in Rostock, which is a town interesting from its old brick buildings, a somewhat exceptional attempt seems to have been made to produce a brick building which should express modern feeling, and, at the same time, harmonise to some extent with the town. We give a view showing the general effect of the building, and the treatment of the central portion on a larger scale. There is rather too much of made ornament and artificial skyline, nor can we by any means admire all the detail; but there is a certain boldness of character about it, and an intention, at least, to be picturesque; and, apart from the question of architectural excellence, it will be of interest to some of our readers as an example of modern German official architecture.

The views are engraved by Mr. J. D. Cooper, from photographs.

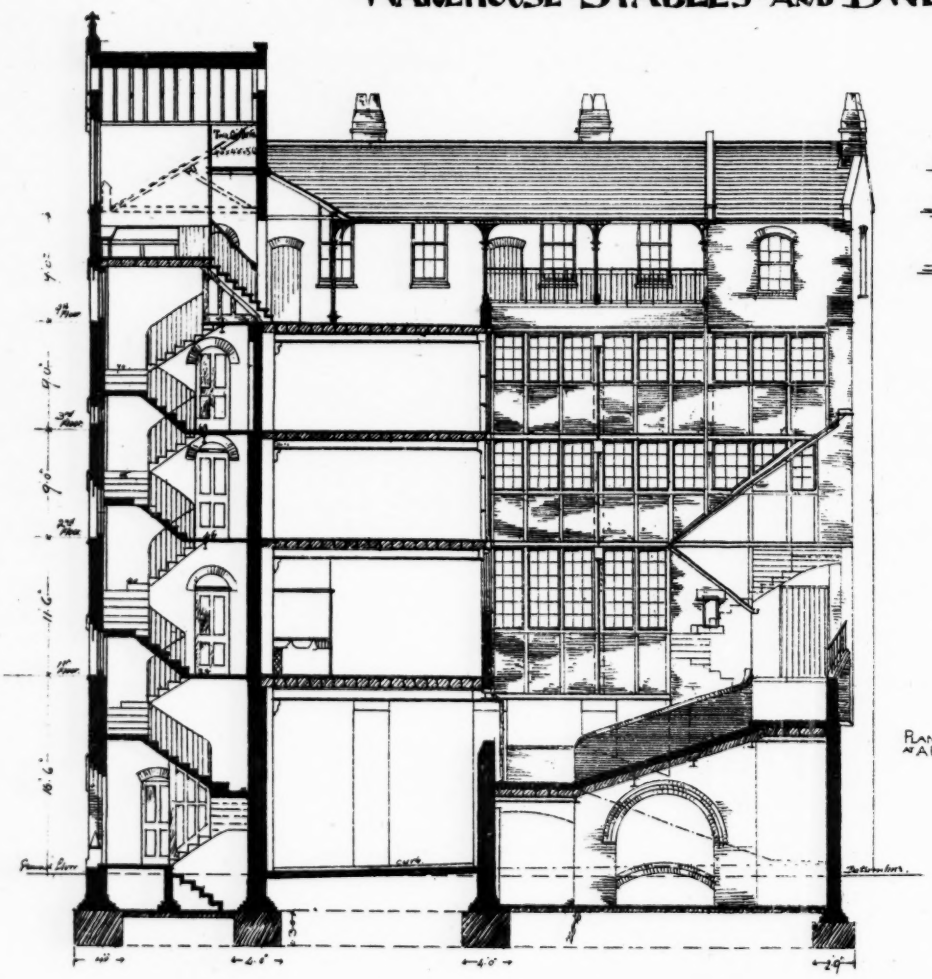
The Civil and Mechanical Engineers' Society.—The annual dinner of this society will be held at the Holborn Restaurant on Wednesday, the 30th inst. The president, Mr. R. Harkness Twigg, M. Inst. C.E., will take the chair at half-past six p.m.



NEW POST-OFFICE BUILDINGS, ROSTOCK, MECKLENBURG.

NEW POST-OFFICE BUILDINGS, ROSTOCK, MECKLENBURG.

WAREHOUSE · STABLES · AND · DWELLINGS · Charles · Street · Drury · Lane



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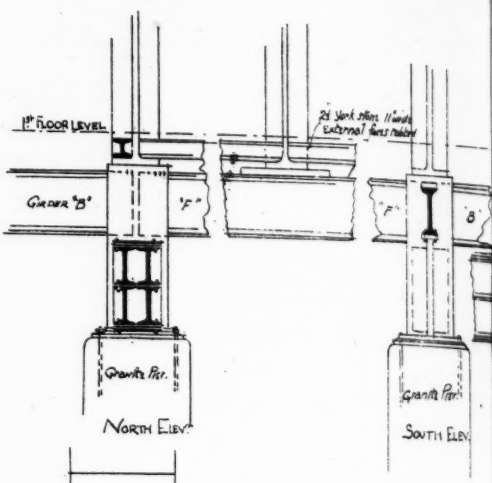

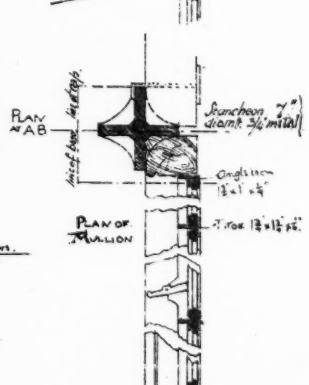

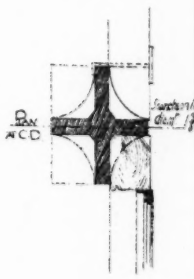

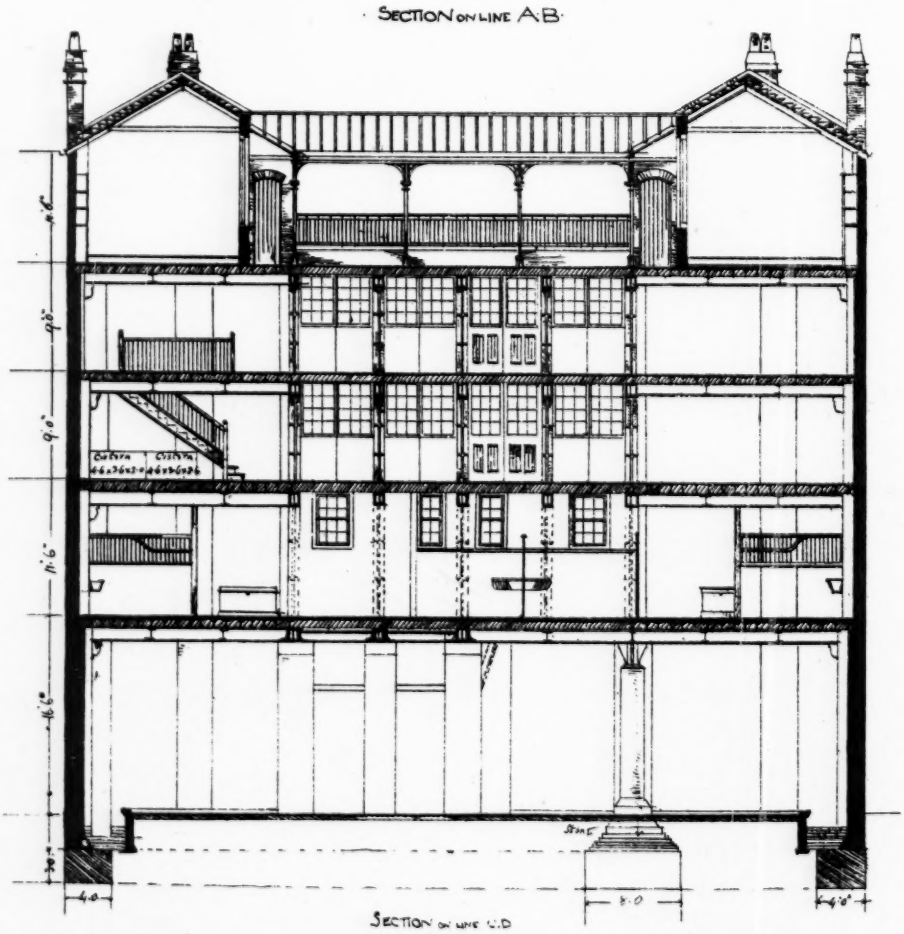

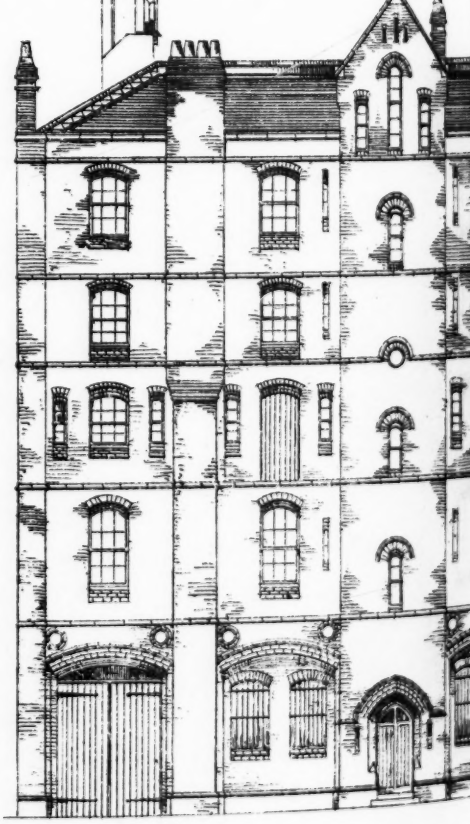

FRONT ELEVATION

C. F. Kell Photo-Lith. & Printer.

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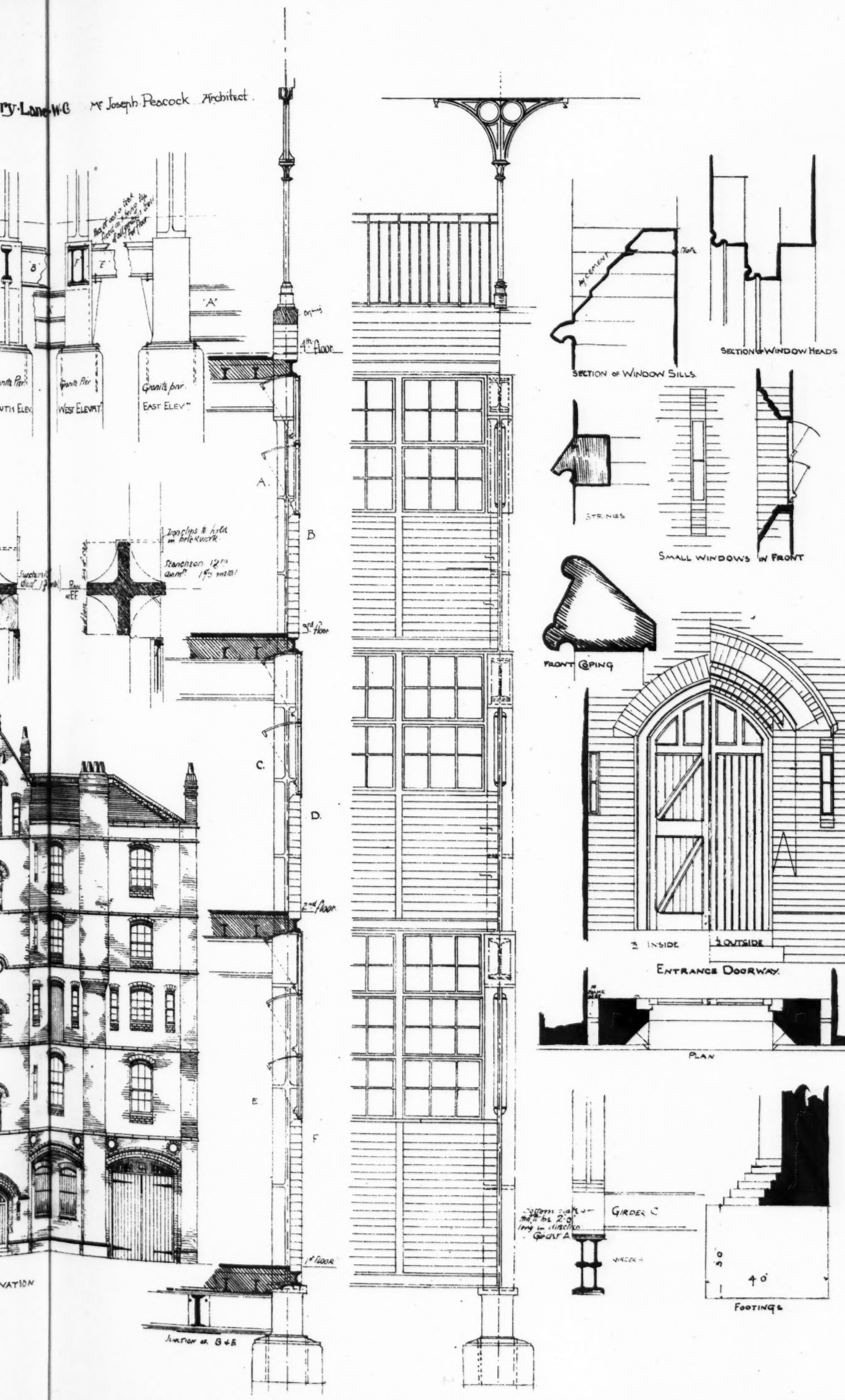
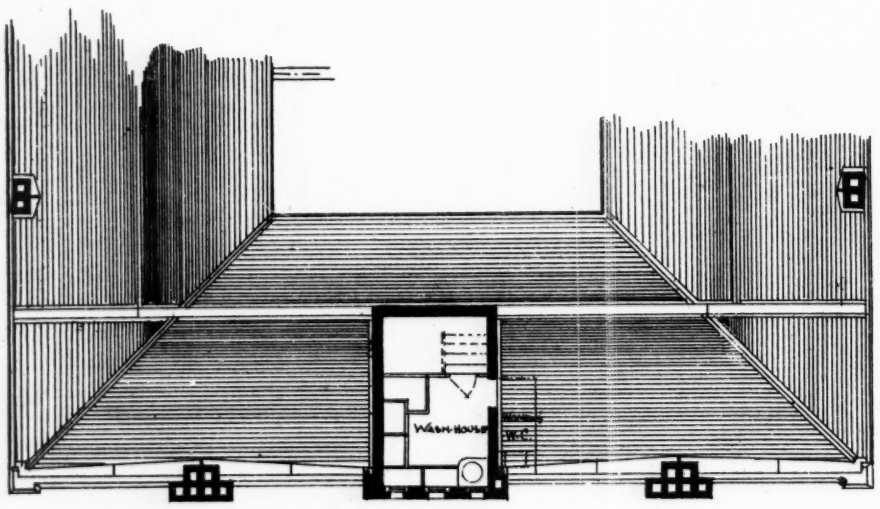


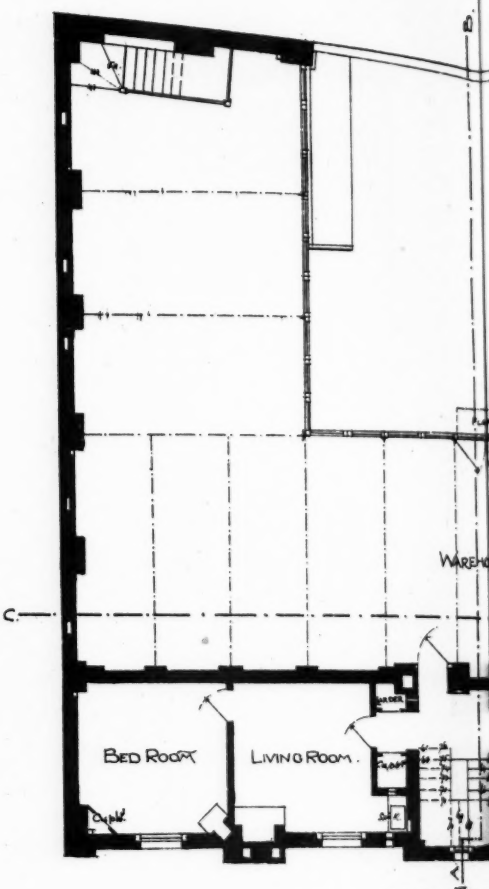
8. Castle St Holborn. London. E.C

WAREHOUSE – CHARLES STREET DRURY LANE W.C.

Mr. Joseph Peacock Architect



ROOF PLAN



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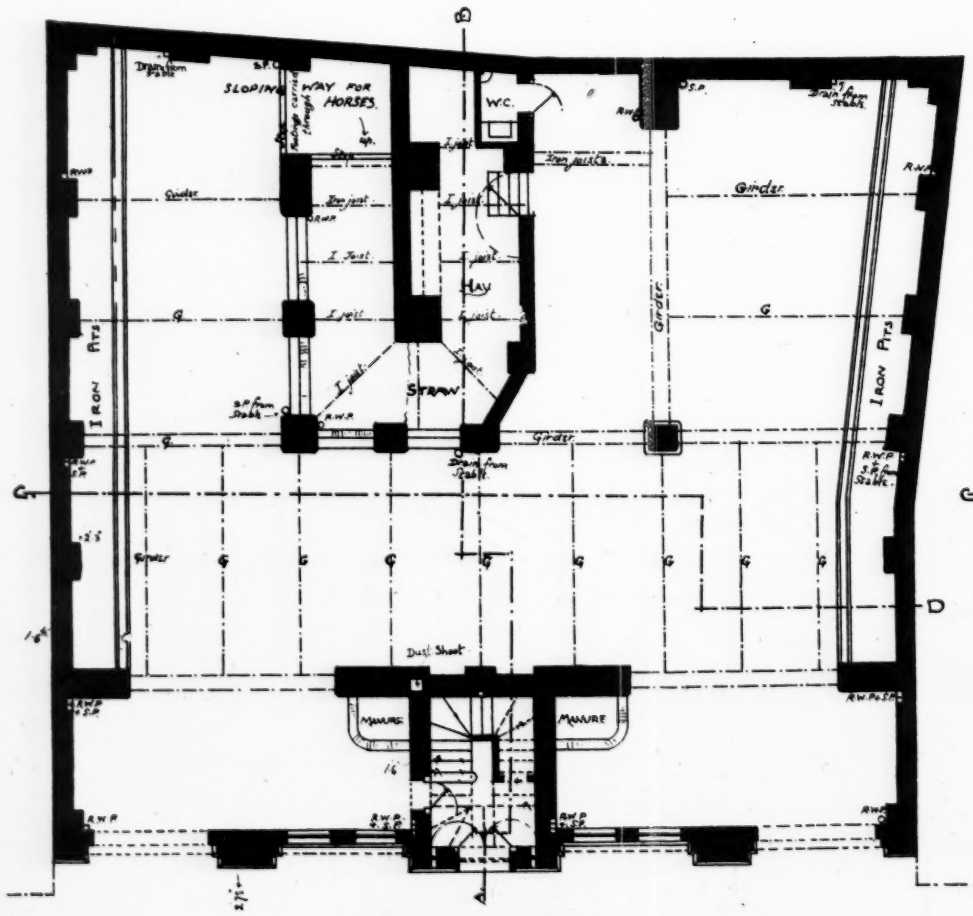
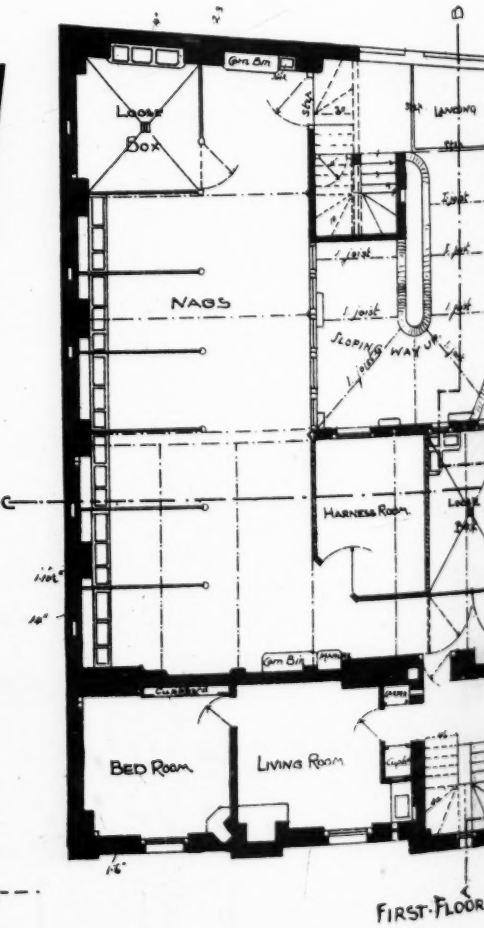
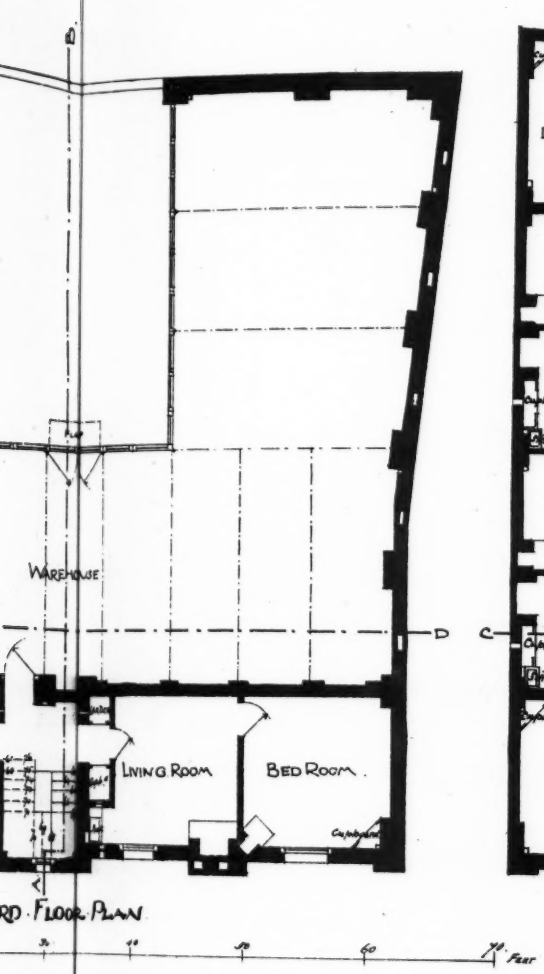


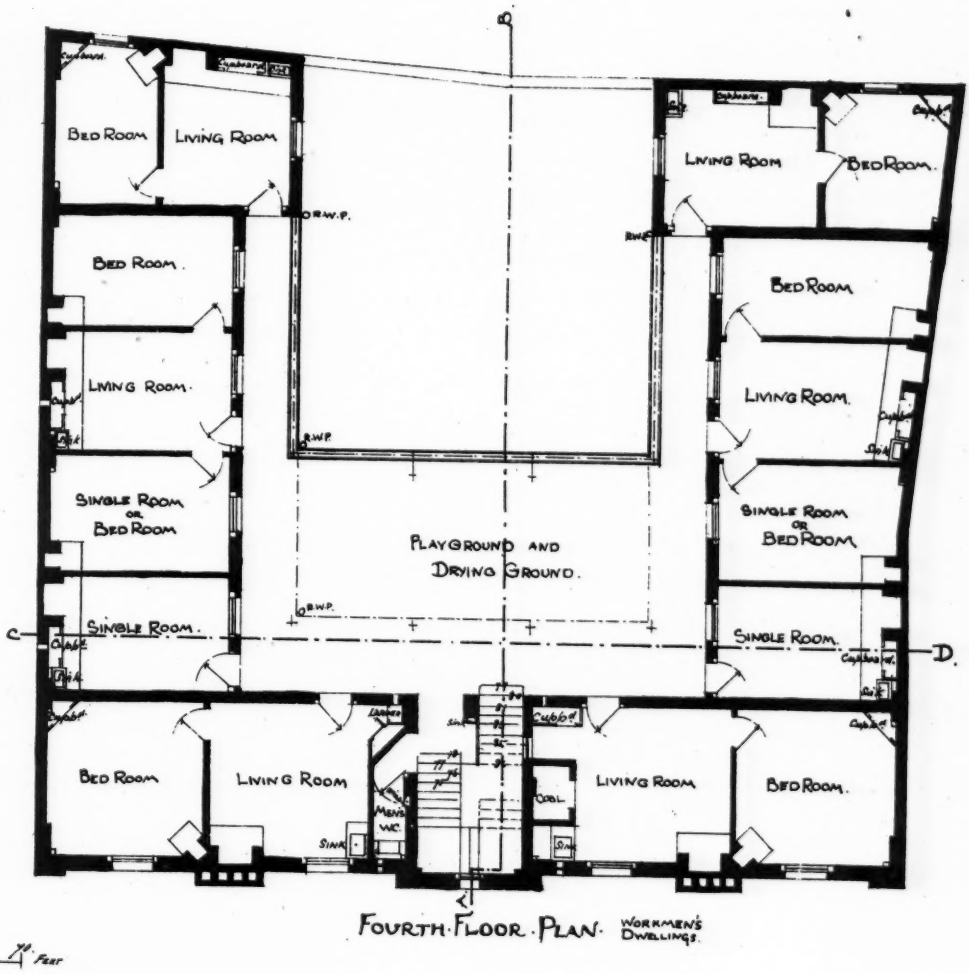
GROUND PLAN

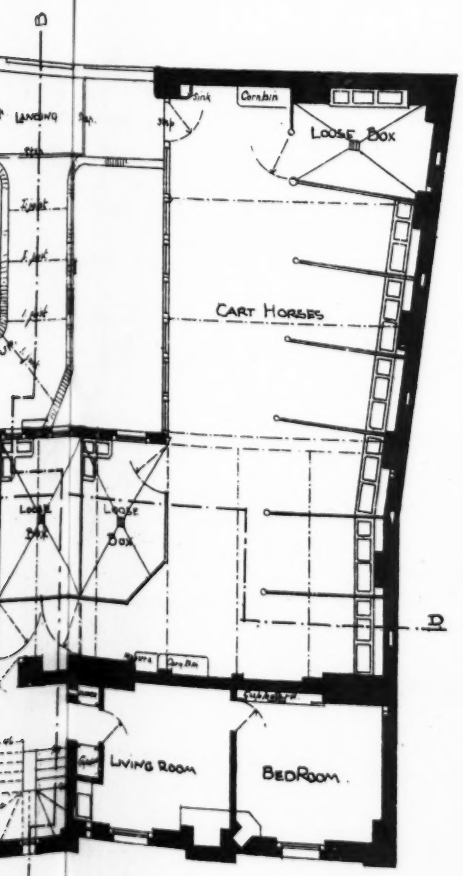


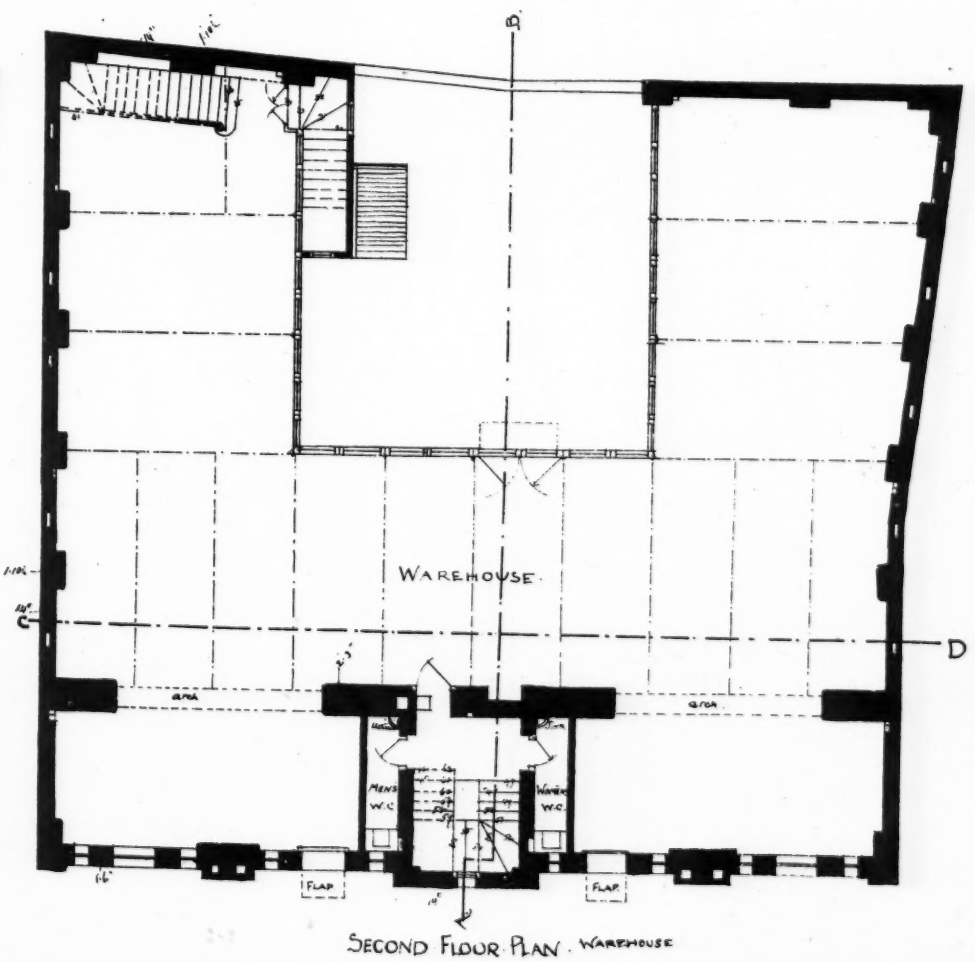
FIRST FLOOR

C. F. Kell Photo-Lith. & Printer.

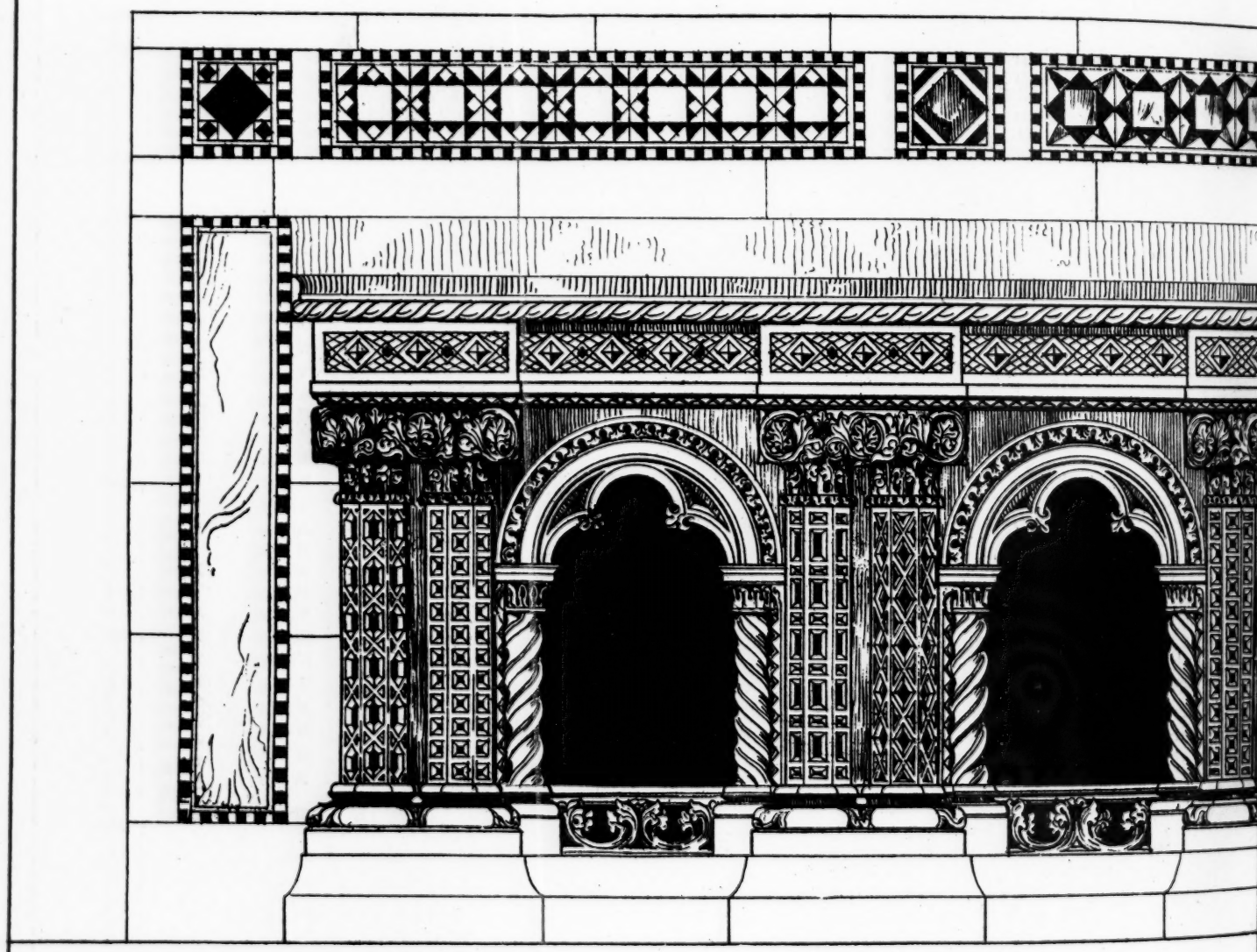

WAREHOUSE
LIVING ROOM
BED ROOM
RD FLOOR PLAN
FEET

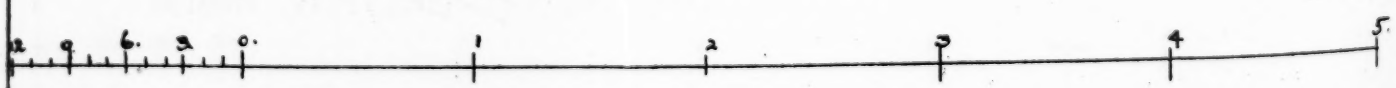

BED ROOM
LIVING ROOM
BED ROOM
LIVING ROOM
BED ROOM
LIVING ROOM
SINGLE ROOM OR BED ROOM
PLAYGROUND AND DRYING GROUND
SINGLE ROOM
SINGLE ROOM
SINGLE ROOM OR BED ROOM
BED ROOM
LIVING ROOM
MENS W.C.
LIVING ROOM
BED ROOM
FOURTH FLOOR PLAN. WORKMEN'S DWELLINGS.


LOOSE BOX
CART HORSES
LOOSE BOX
LIVING ROOM
BEDROOM
FLOOR PLAN. STABLES AND DWELLINGS.

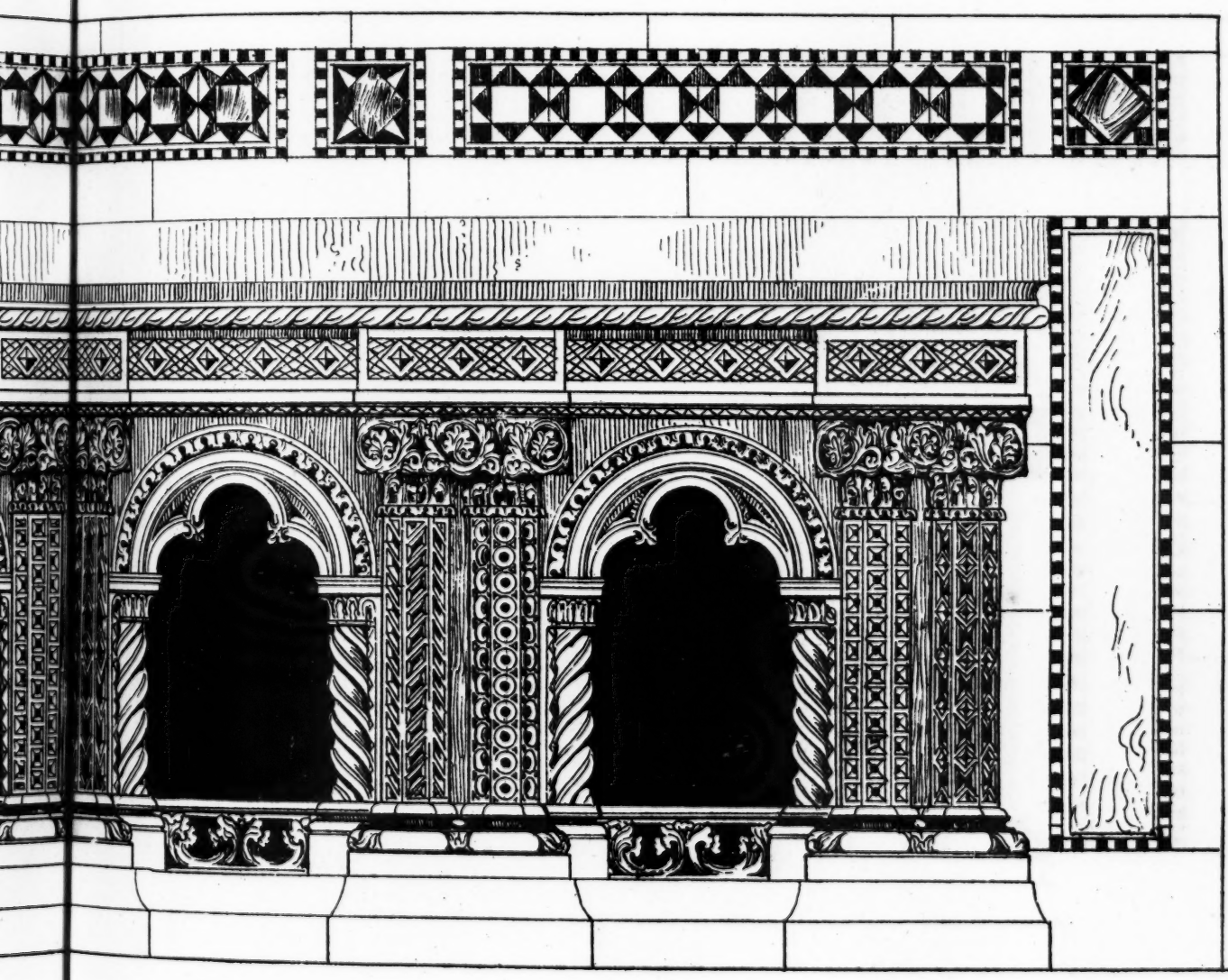

WAREHOUSE
MENS W.C.
WOMEN W.C.
FLAP
FLAP
SECOND FLOOR PLAN. WAREHOUSE

New Communion Table Canterbury Cathedral



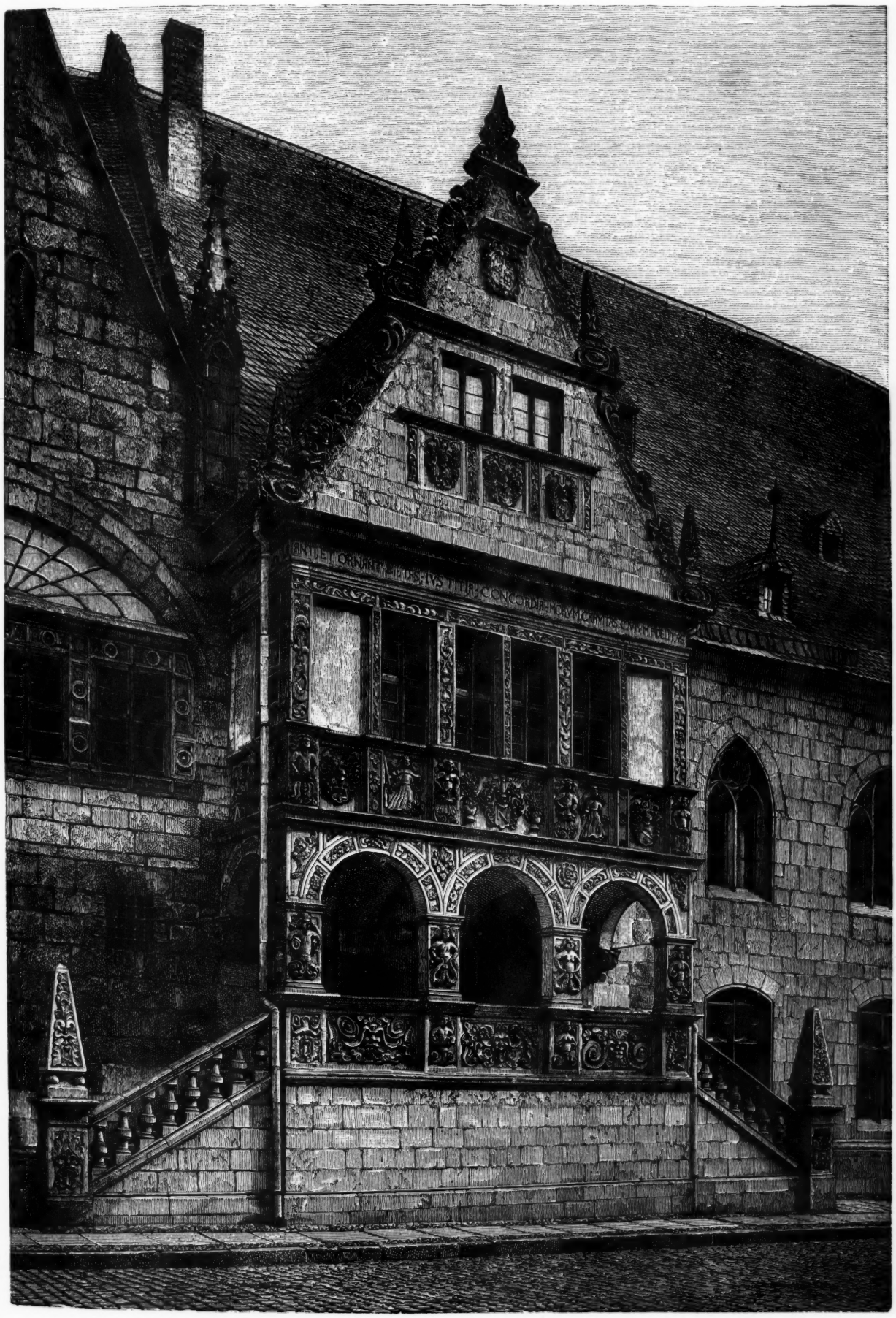


Whiteman & Bass, *Photo-Litho* 236, High Holborn.



Mr. John. Oldrid. Scott. Architect.

Wyman & Sons, Printers, Gt Queen St.



ENTRANCE-FRONT OF THE RATH-HAUS, HALBERSTADT (1663).

PRACTICAL WAREHOUSE ARCHITECTURE.

We give the plans, sections, and other details of this building, as a rather unusual example of the arrangement of a warehouse building to fit an irregular shape of site, and to combine various requirements. On the ground-floor are store-rooms; on the first floor horses, with a sloping way up; above the stables two stories of warehouses, and above them again tenements for the people employed on the premises. The building was erected for Messrs. Pfeil, Stedall, & Son. The ground-floor is occupied with pits for stacking iron, which, of course, is more conveniently and economically stowed there than on a higher floor, which would require very special treatment to meet the great weight; hence the exaltation of the horses to the floor above, contrary to usual custom.

The buildings were erected, in two contracts, by Mr. Nightingale and Mr. Toms, at a cost of 8,500*l.*, from designs by Mr. Joseph Peacock. The building may be said to be remarkably cheap considering what is included in it, and is an unusual example of the combination in one structure of men, horses, and goods employed by the same firm, in such a manner that their different elements do not seem to clash with one another.

COMMUNION-TABLE, CANTERBURY CATHEDRAL.

The design for a Communion-table, or Altar-table (according as the ecclesiastical proclivities of the reader induce him to call it), for Canterbury Cathedral, by Mr. J. Oldrid Scott, is a good example of the architectural treatment of such an object, in which a greater degree of richness and play of fancy is allowable, in adapting architectural details to employment on a small scale, and for what is in reality a piece of furniture, than would be suitable for work on a larger scale and for more solidly constructive purposes. The richness of effect is gained mainly by inlay, and by the use of twisted and octagonal shafts. An inlaid background or border surrounds the whole.

ENTRANCE FRONT OF THE RATH-HAUS. HALBERSTADT.

This quaint and picturesque bit of architecture is an interesting example of the rather homely expression which Renaissance architecture put on when transplanted into German territory. Every portion of detail may be traced to an Italian origin, yet the whole as developed here is thoroughly German. The ornamentation is not altogether well distributed; the panelling over the arches rather weakens the arcade, and the ragged fringe of ornament stuck on to the gable is very bad; but there is a harmony about it as a whole which carries off these defects of detail.

SHERBORNE ABBEY CHURCH TOWER.

Travellers on the South-Western line on their way to Devonshire will notice the great abbey church, and its low, massive central tower rising above the houses, which are crowded all round it, and hide its aisles and ambulatories: after Salisbury, it looks very low and unimportant, and few would imagine what a truly magnificent interior this tower crowns. In its square, massive form its Norman origin shows itself, and reminds one of Winchester and St. Alban's. It is a remnant of the great Norman church, erected by that rather turbulent Bishop, Roger of Sarum, at the time when he was building his castles and churches at Devizes and Malmesbury, and the castle at Sherborne itself; but he was not the founder, for, excepting a small portion now standing, he pulled down St. Aldhelm's and King Ina's cathedral church. After that, obeying the Norman king's order, the bishops had, in 1072, deserted "the vils," and gone to the "great towns" (although Old Sarum, where the Bishop of Sherborne migrated, has sunk into utter insignificance). Three of the great Norman arches and the upper gallery of Roger's tower exist; the fourth was cleared away by the great building abbot Bradford, when he built his magnificent choir in 1430 (about). Many facts have come to light during the careful examination made for the report furnished to the committee by Mr. R. H. Carpenter and Mr. B. Ingelow. It seems that Bradford erected his choir, including the springers of the fan vaulting, and then temporarily roofed and thatched it over; he took out the Norman eastern arch, but before doing so he inserted a double stone relieving arch in the thickness of the east wall, concentric with the line of the choir transverse rib; this arch was apparently inserted in short pieces, and half through the wall, until complete, when the Norman wall under was removed; but the weight coming on the arch seems at once to have caused *some* yielding and fracture in the wall above. They, however, levelled the top of this sunken wall, and started a great slope above the Norman open gallery, which of course had a passage between double walls,—the inner arcaded and the outer solid. This slope enabled the builders to erect their tower, or rather lantern, with only a 2 ft. 6 in. wall, which rested only on the inner arcaded Norman wall. The massive external effect was cleverly produced by buttresses resting on the slope. In the old belfry windows are existing the principal iron cross-bars for *glazing*, passing through the mullions, and glass grooves exist also, showing that the lights were originally glazed as a lantern, yet Abbot Bradford put one or more small service bells into his tower. Possibly he intended the Norman gallery to be seen with a flat floor over it, with a rich panelled arch opening into the choir vault. This vault now exists under the tower also. The old Norman nave, and the early Perpendicular church of All Hallows, built like a great "narthex," were used by the secular clergy, and great disputes arose, partly because these clergy were annoyed by the monks' bells, and in the last great riot an All Hallows priest set fire, by a burning arrow, to the thatch of the choir and the roof. This fire spread up into the tower, and its bells and woodwork fell into the church, and burned its stalls, &c., leaving crimson scars in all directions, discolouring of course the springers of the groining and the panelled arch. Curiously enough, however, the springers of the tower vault are *not* discoloured, though the whole upper part is. This tends to the conclusion that the tower groining was an afterthought, and was put in to hide the injured lantern when Bradford completed his choir vault, adding again to the overburdened tower piers.

These piers, like those of Chichester and Peterborough, were only thin unbonded skins of masonry filled with rubbish, and had crushed in themselves and also dislocated the new work added by Abbot Bradford, so that repairs to windows and other features soon had to be executed, and are now still evident, but it is interesting to note there was then no glass put into the windows of the belfry. There were put in two or three bells; the present "Lady bell," a beautiful one of 34 cwt. in weight; and then, again, Wolsey's bell of 52 cwt.; and then in course of years, even up to 1858, were added others, more or less crowded and badly hung, and wedged up to the old fissured walls, till they leaned outwards and threatened to give way. Important precautionary measures were taken in 1830 by Mr. Percy, on Professor Wilkins's advice, and iron bolts and bands added, and trusses inserted under the bells to relieve the weaker walls. And later still, under the late Mr. R. C. Carpenter, the eastern piers were rebuilt in solid stone (centreing the arches above), and portions of the western piers also. Still, the fractured arches and lantern walls remained, and the badly-hung bells made them vibrate and open with every swing, and the frame knocks against the walls as the great Wolsey tenor turns up and occasionally breaks loose and revolves in its weakened frame. Before preparing their detailed report, a scaffolding was erected by Messrs. Carpenter & Ingelow's directions, and every single stone was measured and sketched, and noted as to whether it could or could not be retained *in situ*. It was found that the tower was built of a poor local stone, much of it "face-bedded," and had perished greatly; but where the Mapperton stone (as good as the best Ham Hill stone) had been used it was perfectly sound: so the north and south sides will require only to be patched where decay has set in, but the whole east side has sunk through centuries of yielding, hastened by the increased decay and stress of the great bells, and the fissures, old as they are and widely gaping as they are, are opening still more, as the relieving arch has not sufficient abutment to resist the pressure. The architects felt, therefore, that when the east wall was necessarily taken down there must be some unyielding base for it to stand on when re-erected: there will, therefore, be a solid brick arch starting on iron springers tied by iron tie-girders, thus taking away all thrust and bringing the weight directly on the already rebuilt piers. Then the old work will go back stone for stone when possible, but much of it was so injured by the great fire that it has yielded more readily to the weather and perished, and cannot be replaced. The west wall, through the sinking of the Norman arch, will require somewhat similar treatment, but not to so great an extent, as only the pier and buttress between the windows and a portion of the wall under are affected by the settlement. Strong platforms are erected over the nave and choir roof, so that the stones taken down can be laid out in position and the sound ones replaced. The rubbish and rotten mortar will be shot down to the ground. The side walls are strongly braced together, and the east wall is now in hand: the west wall will follow, and then the side walls will be repaired and the new parapet and pinnacles erected.

The contractor is Mr. Betton, of Sherborne; and the clerk of works is Mr. F. E. Smith. The new dressed stone will be the best "grey" bed of Ham Hill stone,—it is not as a fact grey, but is of a close, compact, and hard quality, free from the sand and iron veins of other qualities; the walling stone will be the Sherborne stone of a selected quality. Possibly some good old stone may be used from the Town-hall, which is being pulled down to open out the church, and to make way for the new Digby Memorial about to be erected from Messrs. Carpenter & Ingelow's designs. It is in memory of the late Mr. G. D. W. Digby, and will include bronze figures by Messrs. Singer of other great benefactors of Sherborne Church and Castle,—Bishop Aldhelm, Bishop Roger, Abbot Bradford, and Sir Walter Raleigh.

PRINCIPLES FOR THE ORGANISATION OF ARCHITECTURAL MUSEUMS.

The permanent commission of management for the Paris Museum of Decorative Arts have appointed M. Georges Lafenestre to draw up a report on the purpose, character, and system of organisation which should govern the Retrospective Exhibition that will be held at the Palais de l'Industrie during the course of the present year. M. Lafenestre is a member of the Council of Administration of L'Union Centrale, and Commissioner General to the Exhibitions of Fine Arts. It would, therefore, be difficult to find any one better qualified to treat the question at issue; and, as in matters of organisation the French have always enjoyed the highest reputation, we cannot fail to learn something by watching their mode of proceeding. The report is in reality an essay on the best method of utilising an exhibition as a means of improving the education of those who are interested in architecture and in the arts applied to industry. This practical purpose is too often forgotten in the desire of producing a good show rather than of conveying a useful lesson; and we therefore trust that M. Lafenestre's excellent advice may be followed, not merely by the organisers of the Paris Exhibition, but of all similar displays. Thus, as a fundamental principle, M. Lafenestre opens his report by insisting that each division of the retrospective exhibition should correspond with a similar presentation of modern work. If the past can benefit the present, the specimens of ancient work must be presented under the same conditions as the modern efforts of a similar kind.

There is, however, a tendency to exaggerate the merits of the antique, and the greater care should be displayed in selecting only that which really possesses in itself undoubted virtue. Nor is this sufficient. The objects, once found, require grouping in an intelligible manner, so that their true artistic and historic relationship may be evident. The eyes of the student must not be confused by the irregular mixture of discordant forms and contradictory impressions. All classification which illustrates more clearly a distinct idea is useful and fruitful; but classifications that divert the attention, distract the eyes, and embarrass the imagination, are dangerous and sterile. M. Lafenestre, alluding to the severity of foreign competition, urges that a sense of greater confidence must be engendered in the mind of the workman. This will not be attained by the display of incoherent

productions. Such shows may awaken idle curiosity and engender unproductive *dilettantism*. Useful lessons are only imparted by a concentrated assembly of choice productions, all of the same nature, the same epoch, the same style, resuming with as much intensity as possible the particular character of work that best suits the student's aspirations. In the forthcoming exhibition, the first two groups, stone and wood, comprise the whole restrospective section, for the employment of metals in architecture is a modern innovation. In presenting, however, fragments of stone or wood it is impossible for the student to appreciate their virtue unless some conception is given of the whole of which they only form a part. Hence it has been decided that, as far as possible, both models and drawings shall accompany the exhibits. The object will be to show how wood and stone are generally employed, and how the decorative effects produced by them are subordinated to the construction of a solid but expressive mass. To present a series of complete architectural works which shall enable the visitor to follow the modifications various civilisations have wrought in the art of construction, the reporter proposes to borrow the studies and projects of restoration made by the pensioner architects of Rome. These will deal with the buildings of antiquity and the Renaissance. The Minister of Public Instruction might lend the official collected copies of historical monuments to illustrate the Mediæval school, and valuable specimens could be obtained from the Garde Meuble and the Sceaux des Archives. If to this collection were added a few of the best designs which the leading French architects have exhibited at the Salon during the last twenty years, an unequalled exhibition would be offered to the admiration of workers in the arts and sciences.

M. Lafenestre then proceeds to deal with the minutiæ of organisation, and into this we need not follow him. If the principles we have briefly summarised are faithfully carried out, there can be no doubt as to the practical value of the exhibition we are promised for this summer. That the Ministries mentioned will lend whatever assistance is required, is a matter of moral certainty. The country has much to gain from such efforts, the Government nothing to lose, and therefore there should be no difficulty in the matter. By improving the technical knowledge and artistic faculties of both architects and artisans, the organisers of the exhibition will be doing something practical to revive French industry, and restore that prestige which has been somewhat impaired of late years by foreign competition. At the same time visitors of all nationalities can benefit by the contemplation of the rich collection of *chefs-d'œuvre* that will soon be gathered in the palace where so many exhibitions have already been held, and enough has been said to show that the biennial exhibition due this year will be of exceptional interest to architects.

GERMAN ECCLESIASTICAL ARCHITECTURE.

AT a recent meeting of the Saxon Society for Ecclesiastical Art, Herr Victor Schultze read an interesting paper bearing on the question "How shall we build our evangelical churches?" He pointed out, in the first place, his intention of confining himself to matters affecting the requirements of evangelical churches from the standpoint of the Lutheran creed, leaving untouched those questions which relate to the technical portion of the subject. The following definitions were quoted by him in illustration of his remarks:—

1. The edifice should be built with a due regard to the practical requirements of evangelical worship.

2. It should be distinguished in its external appearance from the surrounding profane buildings, and should clearly proclaim itself to be what it is; that is, it should have an ecclesiastical character.

3. The religious sentiment, as embodied in Christianity, should be expressed as fully as possible in the architectural system of the whole, and in its separate parts.

4. The evangelical church should, as far as is consistent with the Lutheran evangelical creed, maintain a connexion with the ecclesiastical art of the past, and not display trials of new styles.

5. It should be a monumental building; that is to say, a work of art, but the artistic element should not disturb the religious spirit of the work.

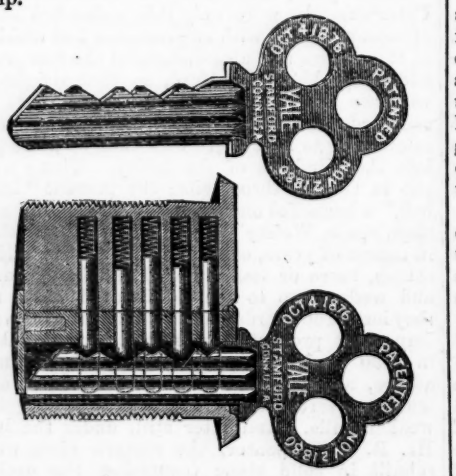
In treating the further question as to what styles fulfil the requirements indicated, Herr Schultze came to the conclusion that the Romanesque and Gothic styles are the most suitable. During the subsequent discussion, Dr. Mothes expressed a wish that the organs of ecclesiastical opinion would take up the matter and would draw up a comprehensive and definite programme, which would guide architects as to the exact nature and extent of the requirements to be kept in view in church-building plans.

IMPROVEMENTS IN THE YALE LOCKS.

THE original Yale lock, with its small flat key of sheet metal, the introduction of which about twenty years ago is said to have "revolutionised the art of lock-making in America," comes before us with a new and very important modification, which consists in furrowing longitudinally the originally flat blade of the key, the lock being made with a cross-section to match. The corrugations are different in every key. We have thus a double security through two sets of changes, which are practically unrestricted in number. The key cannot do its work in the lock unless the notches on its serrated edge exactly fit the tumbler work inside; it cannot get into the lock at all unless the longitudinal corrugations on its surface exactly fit the section of the lock matrix.

Among the advantages claimed by the makers, are that tilting of the key in the keyhole is impossible, as the two are interlocked throughout their entire length. Should any unauthorised person get hold of the key, it is asserted by the makers that this would not serve him towards making a false key, as the corrugated key must conform to the section of the lock with an accuracy which is only attainable by successive processes by specially made machines.

It may perhaps be doubted whether man is capable of making anything in which it is beyond the ingenuity of any one of his fellows to circumvent him; but the Yale lock in its present form seems to be as invulnerable as we can well expect a lock to be, and its security is attained by very simple and direct means, requiring only thorough and effective workmanship.



The cuts show the appearance of the corrugated key, and the cross-section of the escutcheon of the lock, exposing the tumbler mechanism, and showing the key in position under the pins or tumblers.

NORTHERN ARCHITECTURAL ASSOCIATION.

A QUARTERLY meeting of this Society was held at Newcastle-on-Tyne on the 8th inst., Mr. F. W. Rich, president, in the chair. Mr. J. Oswald read a paper containing suggestions for increasing the value and popularity of the Association with the profession and the public. A vote of thanks was accorded to Mr. Oswald for his paper, and Mr. Newcombe moved that the question of the best means for giving effect to the suggestions contained in the same should be referred to the committee. Mr. Reay seconded the motion, which was carried. Mr. Rich and Mr. Newcombe were appointed delegates to represent the Association at the Conference to be held at the Royal Institute of British Architects in May next.

THE CRITERION THEATRE.

THIS theatre was re-opened on Wednesday last, after extensive alterations and improvements. It will be recollected that the theatre was closed in March of last year by the voluntary act of the proprietors, Messrs. Spiers & Pond, in order that alterations and improvements might be made therein, with the view of ensuring safety from fire, facility of egress, and improved ventilation. The problem was chiefly to provide additional means of exit, and the free admission of external air to the interior of this peculiarly situated building,—the ceiling of which is a little below the level of the surface of the pavement in Piccadilly,—and these conditions have only been met by bold structural expedients and the sacrifice of some adjoining property belonging to the proprietors. The work has been carried out in accordance with plans designed by Mr. T. Verity, the architect of the theatre, to the entire satisfaction of the Metropolitan Board of Works, who have granted their certificate of approval of the building for the purpose of a theatre.

The alterations are of such magnitude that in many respects the theatre has been reconstructed. The principal improvements may be described as follows:—A large area open from the basement to the sky has been formed on one side of the theatre, by cutting off a considerable portion of the adjoining Criterion Restaurant, thus giving direct light and air to all parts of the house. As an instance of the efficiency of this new area it may be mentioned that the morning sunshine can stream into the pit. Spacious new corridors have been constructed the whole length of the Piccadilly frontage on the stalls, dress-circle, and gallery levels, providing direct light and ventilation to these parts. These corridors lead on the one side to a commodious new Crush-room and to the new Piccadilly exit, and on the other side to the box-office entrance. In addition to this there are the former exits into Jermyn-street, so that every part of the house is abundantly provided with exits into two distinct thoroughfares.

The auditorium has been in a great measure reconstructed. Many of the private boxes have been removed, and the space thrown into the circles, making the house appear more open and spacious. The whole has been redecorated and upholstered by Messrs. Hampton & Sons.

The ventilation of the house is now effected on a system devised by Mr. W. W. Phipson, whereby it is claimed that the temperature in all parts can be regulated and maintained at 65°. Fresh air is blown into the theatre by a large fan, and the vitiated air is carried off by exhaust tubes leading into shafts warmed by the boiler and grill-flues. The fresh air enters from the back of the house, and the foul-air exhaust is towards the front and over the stage.

The stage, auditorium, corridors, and exits are entirely lighted by electricity, supplied from the most carefully-considered and fully-tested apparatus of the Edison Swan Company, and auxiliary gas-lights are everywhere provided. In the soffits of the upper tiers incandescent lights with white reflectors are sunk. These will be found very useful by those who wish to refer to their programmes when the interior of the house is darkened.

The tile work and wall decorations are by Simpson & Sons, and the structural work has been most admirably carried out by the well-known contractor, Mr. Wm. Webster, of Trafalgar-square.

COMPETITIONS.

Board Schools, Swindon.—The competition for the proposed new schools, to accommodate 600 children, boys, girls, and infants, has resulted in the selection of plans sent in by Mr. W. H. Read, of Swindon, under the motto "Experience." There were forty-six competitors.

Church at Crook.—In a limited competition amongst local architects for the erection of a new church and tower for Crook, near Kendal, the designs submitted by Mr. Stephen Shaw have been selected, and will be carried out under his care.

International Health Exhibition, London, 1884.—His Royal Highness the Duke of Cambridge, K.G., has consented to open this exhibition, on behalf of the president, his Royal Highness the Prince of Wales, on Thursday, the 8th of May, at noon.

DISCOVERY OF A ROMAN ALTAR AT LINCOLN.

Precentor Venables writes to a local newspaper that on the 26th ult., in digging the foundations of the new tower of St. Swithin's, Lincoln, the workmen discovered a very perfect Roman altar:—

"It stands 3 ft. in height by 1 ft. 8 in. in breadth at the base, and 1 ft. 3¼ in. in the upper part; the corresponding depths are 1 ft. 2 in. and 12½ in. It is hewn out of a single block of oolite, of the same bed from which the Roman arch at Newport Gate was built, and belonging probably to the same period,—perhaps early in the second century of our era. The upper part is unfortunately mutilated, and there are hardly any traces of the basin-shaped cavity or *focus* in which the sacrifice was consumed. Each side is carved in low relief; the right-hand side bearing the *præfericulus* or pitcher containing the wine for the libation, the left-hand side the *patera* or shallow dish used for pouring the wine upon the offering. The sacrificial knife, which is a usual companion of these vessels on Roman altars, is wanting. The inscription on the face is happily perfect, the letters being nearly as sharp as the day they were first cut. It is as follows:—

PARCIS. DEA
BVS. ET. NU
MINIBVS. AUG
C ANTISTIVS
FRONTINVS
CVRATOR. TER
AR. D. S. D.

Which may be thus rendered:—'To the goddesses, the Fates, and to the Deities of Augustus, Caius Antistius Frontinus, being curator for the third time, erects this altar at his own cost.' The last three letters are a common contraction for '*de suo dat.*' Hitherto only three altars dedicated to the Parcæ, or Fates, have been found in Britain: at least only three are recorded in Hübner's great work. All of these belong to the Carlisle district, two found in Carlisle itself, and one near Silloth. In two of these the Fates are designated as 'Mothers,' '*Matribus Parcis*,' not 'Goddesses,' as here."

THE ADMIRALTY AND WAR OFFICES COMPETITION.

Sir,—According to their joint letter, which appeared recently in the *Times*, Messrs. E. W. Godwin and J. P. Seddon seem to think the public will be interested to know that they "fail to find the name of one architect of eminence in the list of those provisionally selected in the competition for the new Government Offices."

They further do not hesitate to state that the competition in question is but a "cleverly-arranged scheme," by which results "the absolute prohibition of any first-rate architect from being employed." These gentlemen subscribe themselves "Non-Competitors," a fact which will not suffice to convince unbiassed people that first-rate men have not competed.

Schemes of competition, no less cleverly arranged, have on former occasions resulted in bringing to the front architects such as those who designed St. Nicholas Church, Hamburg; the Houses of Parliament; St. George's Hall, Liverpool; the Scott Memorial, Edinburgh; and the Cathedral for Lille. Under like competitive influences bearing upon the arts of painting and sculpture success at once brought eminence to John Foley, Alfred Stevens, and G. F. Watts. Many other instances might be quoted to prove that in the "untried fish," which Messrs. Godwin and Seddon do not scruple to sneer at, may be recognised eventually the ablest talent of the country.

From certain architects, in and out of season, one hears claims *ad nauseam*, on what is called "the dignity of the profession."

The profession will now know how to value the chivalry of its members who can combine to cast a slur on their brethren whose competitive efforts are still *sub judice* at the hands of those whose competence and honour are beyond impeachment.

Another Non-Competitor.

RESTORATION AND ANTI-RESTORATION.

Sir,—For some years I have been a member of the Society for the Protection of Ancient Buildings. I have ever had strong natural sympathies with its original idea and what should be its primary object, and although the Society has almost altogether lacked that practical element which would have gone so far to increase its utility and value, I am loth to think that it has done no good. Whenever I drive from Marlborough to Avebury, in Wilts, and note the wilful destruction going on of those wonderful Druidical (may I call them?) remains, which are, from time to time, systematically cracked up to mend the roads, I certainly do think the Society remiss in not doing their best to get these most interesting stones preserved. Further, when, ever and anon, I hear that, by a lack of tact rather than of good will, the Association has done harm in places where it meant to do well, I have still comforted myself with the belief that it was true at the core, and so, with all its faults, I loved it still.

From time to time,—and so recently as the present year,—I have been consulted by the Society upon matters appertaining to proposed works, more especially in the West of England. In each instance I have diligently made inquiries, and having found invariably that such undertakings might be safely entrusted to the care of the respective architects into whose hands they were placed, I have had pleasure in testifying to that fact, and by my assurances have stayed useless and, perchance, vexatious action. My subscription for the present year is paid, and only quite recently I received a pressing appeal from the Secretary, asking me, as the funds of the Society were much straitened, to increase the amount of my annual payment. Taking all these facts into consideration, therefore, I was exceedingly surprised to read in your issue of the 5th inst. the long correspondence which has taken place, unknown to myself, between the Society and Mr. Henry Hucks Gibbs, relative to the restoration I have at present in hand,—thanks to Mr. Gibbs's unbounded liberality and pious generosity,—of the high altar screen in the choir of St. Alban's Abbey. As a paying member, as one whose opinion is sought for and acted upon, it would have been at least courteous of the committee to have first put themselves into communication with me, as one of their own body, and inquire what the contemplated work embraced.

It can scarcely have been by anything but the grossest ignorance, or by an actual perversion of facts, that upon February 12th the Society wrote to Mr. Gibbs and informed him that "Restoration is . . . . the positive material alteration of ancient surfaces, caused by cleaning, re-tooling, and that general smartening up which is always one of the objects of restorers," because many of the committee know perfectly well that I do not alter ancient surfaces, and that I am not accustomed to re-tool any old work entrusted into my hands.

Precisely a month later (March 12th) the committee wrote Mr. Gibbs further, saying:—

"You may, perhaps, have found an unknown carver informed with the same spirit as his predecessors of the fifteenth century, endowed with the fruitfulness and knowledge a wise association for mutual help gave them in the application of natural principles to the development of a consistent and beautiful architecture; he may be heir to this spirit, and amidst all the deafening influences of an unsympathetic time of isolated work and competitive prices, may have cultivated the precious seed of Mediæval art to burst once more into bloom over this ancient screen."

I mean to say boldly that this withering sneer at any existing ambitious or possible artistic power in one of its own members is so contemptible and so utterly unworthy of the action of any body of gentlemen, that I cannot bring myself to believe that the great majority of the members knew any more of what was written than I did myself.

Harry Hems.

Fair Park, Exeter, April 10th.

STRAINS IN FRAMED STRUCTURES.

Sir,—I have just had my attention called to your review of my recent work, entitled "Strains in Framed Structures," given in your issue for Feb. 23rd (p. 256).

I wish, first, to thank you for your favourable estimate of the work, and then to notice a few points made in the review which need, I think, some correction.

The "series of plates" to which you allude, and which treat graphically "almost every conceivable form of iron-roof truss," are taken bodily, without change, from Prof. R. H. Bow's admirable work, "Economics of Construction," and will be found duly credited to him. His system of notation is also used throughout the work. So much in justice to one whose labours in this direction are as well known upon this side of the water as in his own country, and to whom I am under special obligations.

As to the braced arch, you entirely misstate my position, without in the least intending to do so, and then devote nearly four columns in order to show my error, and quite unconsciously come to precisely the same conclusion which I had already stated.

You credit me with saying that in the case of the braced arch, continuous at crown and fixed at the ends, "the resultant pressures do not pass through the ends of the arch where they abut on the skewbacks, but they are tangent to a hyperbolic arc within the arch and pass below the abutments."

As these words are put by you in quotation marks, the natural inference is either that they are my identical words, or at least a correct paraphrase. You will probably be surprised to learn that they are in reality neither. Yet such is the case. You cannot find in my work either these words, or anything to justify such an interpretation. What I really do say (page 163) is, that "the reactions no longer pass through the ends of the arch, but pass through points *above or below* the ends."

A comparison of these words with your interpretation (for it is impossible that you intended it as a literal quotation, notwithstanding the quotation marks) reveals at once the difference and the reason for it. From a hasty reading you apprehended only a portion of what was said. Under this misconception you then proceed to show that the reaction may sometimes pass *above* the ends, which, so far from denying, as you evidently think I do, is precisely what I state. Thus the entire point of discussion, to which you devote nearly four columns to set me straight, has no real existence, but is entirely based upon making me say that which I have not said.

What I have stated, and desire now to state again, is, that for a *flat, parabolic* arch, of *uniform* section, continuous at crown, fixed at ends, and of *invariable span*, the point of intersection of any single weight with a horizontal line situated at one-fifth the rise of the arch above the crown, will give a point in both the resultant pressures. Also, that this point thus known, the *directions* of these pressures are given by drawing them through the point thus determined and *tangent to a hyperbolic arc*, which I have shown how to construct and locate. This is susceptible of rigid demonstration, and I have elsewhere deduced it. The resultant pressures being thus determined, it will be found, as I have correctly stated (and you have incorrectly reported), that they will always pass either "*above or below*," but never through the ends of the arch.

Whether, in the cases you discuss and illustrate, both pressures will pass *above* the ends (as you have represented), or one above and one below, or both below, will depend upon the special dimensions, position of load, &c., and can, in any special case, be best determined by applying the very construction I give, and which you are only apparently criticising.

In so far, therefore, as your statement imputes to me that which I do not say, and your discussion assumes implicitly that my construction does not cover the case to which it is applied, it seems to me that both statement and discussion need correction.

As to the proper location of the neutral axis in the case of a beam, your position is undoubtedly correct; but I venture to think that your estimate of the error committed is excessive. The assumption that the neutral axis passes through the centre of gravity is, as you point out, only correct (theoretically) in the case of symmetric sections. It may, however, be justifiable in others. The fact, which you also notice, that all authors make this assumption would of itself indicate either that all have blundered, or else that they have disregarded as a nicety that which has no practical effect. The latter conclusion would seem the most probable.

That this is, in fact, the case I think your own examples show. In the case of the triangle, the moment of inertia about the axis through the centre of gravity is $\frac{b\,h^3}{36}$ and the axis is at two-thirds the height, or $\frac{66}{100}h$ from the apex. When the neutral axis is properly located as you suggest, it lies at a distance from the apex of about $\frac{64}{100}h$ instead of $\frac{66}{100}h$, and the moment of inertia is $\frac{b\,h^3}{35{\cdot}3}$ instead of $\frac{b\,h^3}{36}$ If we take, as you say, the moment of resistance equal to the moment of inertia "divided by the maximum distance of any of the matter in the cross-section and multiplied by the elastic strength per unit of area," we have, in the second case, the correct moment of resistance $\frac{b\,h^2c}{22{\cdot}6}$ and in the first case $\frac{b\,h^2c}{24}$, an error of about 6 per cent. instead of "12 per cent."

Again in your other example, the moment of inertia is correctly $\frac{16}{3}$ while the usual method gives $\frac{14{\cdot}8}{3}$ The moments of resistance are then, according to your rule, 2·66 and 2·46, giving an error of 7½ per cent. instead of "43 per cent."

When we remember that the theory of flexure is based upon several other assumptions, quite as questionable as the one you take exception to, the influences of which are quite as great, and which are still accepted, we can perhaps accept this one also. As a matter of fact, the neutral axis is *not* at the centre of gravity even of symmetric cross-sections. We merely assume that it is, because the error is slight, and abundantly covered by the "factor of safety." For the same reasons we accept the same assumption for unsymmetric sections. Practical designing, and the accepted theory of flexure, would remain entirely unaffected by the introduction of such a correction as you suggest, while the resulting formulæ and methods would be greatly increased in complexity and labour. The determination of the deflection, breaking-weight, &c., as well as of the neutral axis, would be, as you say, "always a difficult matter," without any compensating advantages.

A. J. Du Bois.

Sheffield Scientific School of Yale College,
New Haven, Conn.,
March 31st, 1884.

*** The quotation was not intended to be the exact words used by the author, but merely a

concise summary of their meaning (page 165, fig. 143).

The only amendment the quotation seems to require is the addition of the word *above*, so as to read *above and below*. Although the author attaches great importance to this, and founds the whole of his complaint on this omission, it in no way affects our observations. Fig. 143 shows both thrusts passing below the ends of the arch, which is impossible according to our view. The space we devoted to the subject was, as stated at the time, to guide the student and future writers on the subject, not, as the author supposes, to set him straight. It appears to us that a correct theory would be equally applicable whatever the proportion between the rise and span of an arch. That there is an essential difference between us is evident. The author says that "they (the thrusts) will always pass above or below, but never through the ends of the arch." We say that both thrusts cannot pass below, and one may pass through an end.

With respect to the position of the neutral axis, we are pleased to see that the author admits the accuracy of our theory. It is not, however, correct to assume that authors have generally disregarded a nicety because it has no practical effect. On the contrary, many have taken great pains to prove that the neutral axis passes through the centre of gravity. Nor is the resultant error so slight that it may be neglected. The error in the triangular section will be found to amount to 12 not to 6 per cent.; and in the inverted ⊥, if calculated by moments, to 47 per cent. instead of 7½. We might have taken examples which would have given preposterous errors.

ROYAL EXCHANGE.

SIR,—It is deeply to be regretted by every lover of Classic work that in fixing the new iron roof over the quadrangle it should be found necessary to remove the open ornamental parapet around the four sides of the interior quadrangle, as designed by the late Sir W. Tite, assisted by Professor Cockerell, in his life-time.

It has been said that the works of the architect, like those of the musician, are eternal. But this comfort and consolation architects have had in the past is being, by this restless age,—which craves more for novelty than for sound substantial work and design,—fast swept away for ever, whilst buildings done by Cockerell, Tite, Wren, Hawksmoor, Kent, and Gibbs (also Inigo Jones) are in danger of having all their original features utterly defaced, if not the original work swept or improved off the face of the earth.

You have only to take the inside of the church of St. Paul's, Covent Garden, for an illustration of what I say. "TITE."

ANTS IN HOUSES.

SIR,—The often-asked question again appears on page 528 of last week's number, namely, "How to get rid of Ants in Houses?" More remedies have been given than the number of times the question has been asked, but still your correspondents "want to know, you know."

Two parts of the house in which I am now living were suddenly discovered to be infested with these little animals, but great pests. I amused myself two or three hours for several nights by catching them with a small brush, dipping the same in water in a pudding-basin with a spirit-lamp under to keep the water as hot as possible. Hundreds and hundreds I caught and scalded in this way, but still the enemy did not decrease. When, one night, my knees having had long enough acquaintance with the floor, a sudden thought came over me, or, as some would say, a spirit whispered to me, "Why not try Keating's powder?" The powder was obtained from head-quarters. The enemy's camp was reached as near as possible, and was well peppered, as also were their meeting-places and promenades. After a couple of days' enjoyment,—or otherwise,—of the powder, the enemy was discovered as little black specks distributed over the field of battle as thickly as the Arabs we were lately told of. My enemies I swept up and cremated, but did not urn the remains. I only earned the pleasure of getting rid of them, for now none are to be seen.

In proposing any speciality for a remedy it is generally supposed or said, "Oh, he is only advertising his own wares!" But you, Mr. Editor, will know that I have not any interest in the above powder or the inventor, but merely desire to place before the public a happy thought which has turned out, in my case, a remedy for an evil. Y.

New Congregational Church, &c., Hampstead.—Messrs. J. L. Bacon & Co., of 34, Upper Gloucester-place, Dorset-square, have been entrusted with the erection of the apparatus for the warming and ventilation of these buildings, which were referred to in our last.

DISSENTING CHURCH-BUILDING NEWS.

Trowbridge.—The new Tabernacle at Trowbridge was opened on the 19th ult. The style adopted by the architects is Perpendicular. The new west front of the Tabernacle extends 20 ft. beyond the old one. The external walls are of Bradford (Wilts) stone, faced with random-coursed work. The dressings are of a superior freestone from the district. The roofs are slated. The total cost of reconstructing the chapel, remodelling the school-buildings, and building ten new class-rooms, including all outside work to the extensive premises, all furniture, the organ and stained-glass, and architects' commission and salary of clerk of works, is 8,400*l.* The stained-glass and ornamental glazing and colour decoration are by Messrs. Campbell & Co., Newman-street; gas-fittings, J. Stone, St. George's-road; blinds, Guyman & Son, Carburton-street; marble mosaic, Pattesons, of Manchester; umbrella-holders, Nettleford & Sons, High Holborn; organ and case, W. Sweetland, Bath. The architects are Messrs. Paull & Bonella, of 2, Chancery-lane, London, and Manchester.

Morpeth.—On the 1st inst. a new Wesleyan Methodist chapel was opened in Manchester-street. The building occupies the site of the former chapel and of a caretaker's house which adjoined it. The ground slopes rapidly from front to back, and advantage has been taken of this to obtain, in the basement, a schoolroom 36 ft. by 23 ft., together with a large vestry and class-room. To give sufficient height to these rooms the floor of the chapel is raised 5 ft. above the street level. The chapel is seated for 360 persons, and the entire cost is 1,600*l.* The warming apparatus is by Messrs. Dinning & Cooke, of Newcastle; the gas-fittings by Messrs. Jones & Willis, of Birmingham; and the ventilation by one of Boyle's air-pump ventilators. The lead glazing is by the Gateshead Stained Glass Company. The contractor for the whole is Mr. D. M. Spence, of Amble, and the architects are Messrs. S. Oswald & Son, of Newcastle-on-Tyne, under whose superintendence the work has been executed.

PROVINCIAL NEWS.

Newcastle-on-Tyne. — The Young Men's Christian Association having purchased St. James's Congregational Chapel, Blackett-street, vacated by the removal of the congregation to their new church recently erected in Bath-road, are about to convert the same into premises for the use of the Association. The basement will contain a restaurant (to be conducted on temperance principles), with retiring-rooms for ladies and gentlemen; and also a gymnasium, with dressing-room, bath, &c. The principal floor will comprise reading-room, parlour, class-rooms, secretary's office, retiring-room, &c. The top floor will be a new one, constructed about the level of the former galleries, and will be entirely devoted to a large hall (with ante-room) for public meetings, accommodating nearly 500 people. The architects are Messrs. S. Oswald & Son. The contractor for the structural work is Mr. Sidney Millard. The plumbers' work will be done by Messrs. Walker & Emley, and the painting and glazing by Messrs. J. Richardson & Co., all of Newcastle. ——The High Gosforth Park Company are erecting near the grand stand at their race-course additional stabling for thirty-six horses; chiefly in boxes, although a few stalls are provided. This is the first part of a scheme which will ultimately provide for 100 horses, in addition to existing accommodation for about eighty. The scheme also includes dormitories and mess-rooms for about 200 stable boys in a large detached block. The builders are Messrs. G. Simpson & Son, and the architects are Messrs. S. Oswald & Son, of Newcastle.

Exeter.—At the Town Council meeting on the 9th inst. an animated discussion took place as to whether the heating and ventilating arrangements for the New Pauper Lunatic Asylum for the city should be handed over to Mr. Phipson, C.E., to carry out personally, or whether Mr. Phipson should be employed professionally to only superintend, and the work tendered for in the usual manner. Mr. Phipson estimated the entire cost at 6,235*l.*, and was prepared to guarantee its completion for that sum; or, he was ready to direct the carrying out of his scheme, charging 5 per cent. on the outlay and 3*l.* 3s. a day and expenses.—Councillor Pidley pointed out that they had to pay 5 per cent. on all this work to their architect, Mr. R. Stark Wilkinson; 1 per cent. to Mr. Fred. R. Smith, the quantity surveyor; and now they were asked to pay another 5 per cent. to the engineer, making 11 per cent. for what he deemed was only part of the architect's legitimate work.—Councillor Harry Hems pointed out that the ventilating, &c., was decidedly a speciality, and work for a civil engineer rather than for an architect. But, it struck him as derogatory to the profession that Mr. Phipson should want both to make the plans and do the work! He thought an able engineer would be found in Mr. Phipson, and a good working firm of engineers might be entrusted to carry out that gentleman's designs.—Alderman Huxtable (a retired builder) said they had no specifications or bills of quantities, and he objected decidedly to giving an order for the work without knowing what was to be done for the money. He considered that all public work should be tendered for.—It was stated in the course of further discussion that the architect (who is son of the present mayor) was strongly in favour of Mr. Phipson doing the work *in toto*, and that he (Mr. Wilkinson) asserted that not a stone of the foundation of the new asylum could be put in until this necessary matter was settled.—It was ultimately decided by a vote of fourteen to eight that Mr. Phipson should be entrusted with the work at a cost of 6,235*l.*—Some conversation afterwards took place relative to Mr. F. Smith claiming to be paid, as a matter of custom, his percentage for quantities upon the amount of the engineering work, although he had had nothing to do with it. He made his charge upon the entire sum of contract. It was finally agreed to pay him this, *i.e.*, 1 per cent. upon the amount of amended tender, 55,700*l.*

SCHOOL-BUILDING NEWS.

Great Harwood.—New Schools are about to be built at Great Harwood, near Blackburn, in connexion with the Methodist Free Church. The buildings will be used for day and Sunday school purposes, to accommodate 1,000 scholars, and will consist of a large school-room with seven class-rooms adjacent thereto and an infants' school for 150 infants. The plans have been prepared by Messrs. Maxwell, Tuke, & Hurst, architects, Southport, and the works will be carried out under their supervision.

Chatham. — New Schools for St. Paul's parish at Chatham, have been opened by the Bishop of Rochester. The architect was Mr. R. Willey, of Ludgate-hill, London, and the builder was Mr. Dorey, of Brentford. We are informed that the cost of these schools was at the rate of 3*l.* 10s. per child only, exclusive of site.

Earlestown. — A lecture-hall and Sunday-schools are about to be built in connexion with the Primitive Methodist Chapel, Earlestown, near Warrington. The buildings will comprise a hall capable of seating 500 adult persons, five class-rooms for twenty scholars each, an infants' room for sixty infants, and a library. Separate yards and offices will be provided for boys and girls respectively. The plans have been prepared by Messrs. Maxwell, Tuke, & Hurst, architects, Southport, and the works will be carried out under their superintendence.

Manchester.—The extensive schools belonging to the Wesleyans, at the southerly end of the City-road, Manchester, are about to be considerably enlarged, from the designs of Messrs. Medland & Henry Taylor.

Books.

Older England, illustrated by the Anglo-Saxon Antiquities in the British Museum. By J. FREDERICK HODGETTS. London: Whiting & Co. 1884.

IT was a happy thought on the part of Mr. Hodgetts to give animation to the dead objects which fill some of the glass cases in the British Museum and make them tell the tale of their almost forgotten existence. He had the good fortune, also, to secure an intelligent audience, and he quotes with evident pride Mr. Ruskin's remark that what he had heard from the lecturer's lips had been a new revelation of truth and poetry for him,—overturning some of his most cherished opinions, but substituting for them a fresh field of thought. No doubt there is an element of poetry in all

scientific and historic research. We may almost say that men like Newton and Darwin were discoverers by virtue of possessing a share in the same divine faculty which found other expression in Dante and Milton. Mr. Hodgetts is not without it; and, perhaps, we may refer to poetical exuberance the flights of fancy which he occasionally takes in the region of etymology. On the whole, however, even from a perusal of these lectures, one gains a very distinct impression of the life and circumstances of our old English ancestors; and we may, therefore, congratulate Mr. Hodgetts not only upon having made the head of Memnon vocal, but on having provided it with chords that are, in the main, true and harmonious. The author's method of "handling" his subject is very simple. He takes up some relic of past times,—a sword, a brooch, or a ring,—and discourses thereon according to no settled plan, but in an easy and communicative way. Of course the very name or names of the object are often full of suggestions. Thus the word "sword" contains a wealth of meaning which seems almost inexhaustible. "The root *swer* brings us farther and farther into the gulf of time, and shows us the sense of shining, gleaming, flashing, and, more remotely, *heaven*, which in the grand old speech of the far East is called the *Swerga*. To vow to heaven, then, was to swear; Swedish, *svärja*; English, *swerian*; German, *schwören*. Now, the thing that bound a king to his God, an earl to his king, and a vassal to his earl, was the symbol of power, of truth combative, of protection, and of glory,—all which attributes reside together in the sword alone. Hence the very name is cognate with the root expressive of the brightest hope of human life, and so with death and brighter life beyond the tomb. 'He sweareth' means 'he takes his sword and vows to heaven a solemn oath upon it.'"

We cannot help thinking that this, however pretty, is just a little fanciful; and we like Mr. Hodgetts better when he is telling us some facts about the history of the weapon which he has gleaned from divers sources. The old English sword was a massive, weighty, double-edged weapon, with a cross-guard curving downwards. The grip, or hilt, was of wood, bound with leather, and often profusely ornamented with gold. It was one of the treasures of the house, and bore some name descriptive of its virtues. It was a vastly more powerful weapon than the Roman sword; and its descendant, in an elongated form, is the *longue épée* of the thirteenth century, with which monumental remains have made us familiar. In the latter, however, the slight projections at the hilt have become prolonged, and thus we get the straight cross-guard,—the divine emblem,—which often brought courage and consolation to the dying Crusader.

Mr. Hodgetts says that the sword in art has not been sufficiently utilised as a means of decoration. The grouping behind the warrior's seat of the weapons which he used could not fail to be picturesque; for the most haphazard arrangement,—spear, and shield, and sword,—invariably gives, we are told, effective combinations of form. Mr. Hodgetts may be right, but the opportunities for making the experiment are not likely to be numerous, and we should strongly object to the employment of old English weapons to decorate the hall of a red-brick mansion of the now prevailing style.

The form of the ancient English shield was generally circular, with the boss in the centre. It was concave, so as to cover the breast and shoulder, and so constructed as to leave an aperture for the hand to grasp the bar of wood which formed the handle. Over this aperture was the boss which, by its projection, guarded the hand. Within, the shield was lined with cloth or leather stretched over the woodwork, which was light linden. Outside a rough hide was nailed and bordered by a rim of gilt leather, bronze, or even gold. Mr. Hodgetts thinks that the scroll-shaped shield which Strutt and Meyrick depict had no existence except in the fancy of the limner. But, besides the round shield, or buckler, there was another defensive arm known as the *scild-truma*, or troop shield. This was of an oval shape, and large enough to cover the whole person, the lower extremity of it resting upon the ground.

The subject of the brooch gives Mr. Hodgetts an opportunity of speaking about the condition of women in older England. Of course he draws special attention to what, with pardonable exaggeration, he calls "the almost awful respect for woman" which from the earliest historic period has been the characteristic of the Scandinavian race. What was effected for the Latin nations by the *cultus* of the Virgin Mary and the softening influences of Chistianity belonged to the barbarian Teutons by nature. We wonder that the modern advocates of women's rights in this country have not made more of the argument from antiquity, and pointed to the exclusion of women from the senate and the ministry as tokens of degeneracy. "The German women were admitted into the councils of the men; they were consulted on all important business, especially on such matters as had proved too tough for the sword-like intellect of the men to cut through. Consequently, we find ten priestesses to one priest! We find our fathers listening to the advice of women upon all possible occasions, and thoroughly believing in them." In the last respects we are not disposed to admit that younger England has greatly changed.

The archæological information with which these lectures abound makes them valuable to the student, and a good many popular errors in reference to our remoter ancestors are clearly exposed. For instance, the cruciform *preons* often found in East Anglian graves have been thoughtlessly supposed to owe their shape to Christian influences. Mr. Hodgetts, therefore, does well to point out that the cross in not a Christian invention, and that cruciform ornaments were in vogue long before the date of the Crucifixion. Their existence, as well as the existence of well-wrought jewellery, arms, and utensils establish the fact that English art is not due to Roman teaching, but is English in its origin.

The Nationalisation of the Land. By Samuel Smith, M.P. London: Kegan Paul & Co. 1884.

Fallacies of Socialism Exposed. By Samuel Smith, M.P. London: W. Reeves. 1884.

National Progress and Poverty. By Samuel Smith, M.P. London: W. Reeves. 1884.

THE three publications which appear at the head of this notice are each from the pen of Mr. Smith, the Liberal member for Liverpool. They are refutations of the Socialistic opinions expressed by Mr. Henry George, Mr. H. M. Hyndman, and Mr. A. R. Wallace, who are doubtless as well meaning in their intentions as they are mischievous in their views. Any one who desires to see Mr. George's arguments shortly, clearly, and ably exposed cannot do better than read these papers, especially the one on "The Nationalisation of the Land." Mr. Smith is not only a theoretical political economist, but a capable and experienced man of business, and, we confess to our suprise, writes in a brighter and more polished style than the majority of so-called literary men. It is impossible for us to enter at length into an examination of these pamphlets, because being short in themselves they will hardly bear compression. Mr. Smith shows very clearly that "the first conditions of all national progress are security for life and property," and then he demonstrates how nothing "could be more destructive of the social welfare of any old and peaceful country than to tear up the foundation of all property by disputing existing titles to the soil." Another point which is often overlooked by socialistic adherents is made by Mr. Smith, namely, that by a confiscation of landed property, not only would owners of land be defrauded, "but likewise all the mortgagees, whose name is legion," and, as he points out, "the sole livelihood of multitudes of widows and orphans depends on trust-money" invested on the security of land, and if land is confiscated the security of these persons is gone, and without it their means of subsistence. To any one who has at all carefully considered the plans of the socialists, to repeat Mr. Smith's arguments is like unto the doings of the man of whom it is said that "thrice he slew the slain." The calm reasoner does not require the assistance of Mr. Smith's arguments. But there are hundreds of persons who have not the time or inclination to think out those matters for themselves, and to these we very earnestly commend the perusal of Mr. Smith's publications.

Heanor.—A Munich east window has just been erected in the parish church of Heanor, Notts, by Messrs. Mayer & Co. The subject illustrates the text, "Come unto Me, all ye that labour."

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

April 4.—5,928, J. E. Doughty and P. Kranich, London, Automatic Ladder Machine for Builders' use.—5,931, R. M. Ormerod, Carlisle, Forming Domes and Circular Buildings in Concrete and Plaster.—5,940, A. B. Merrick, Exeter, Draining Roofs.—5,962, H. R. Hughes, London, Flower-pot Window-guard.—5,963, J. C. Hudson, London, Fireproofing Ceilings.

April 5.—5,969, A. W. Kershaw, Lancaster, Downcast Ventilators.—5,979, J. Jarman, Birmingham, Cleaning Chimneys.—5,983, R. T. Bells, Birkenhead, and T. B. Stott, Rockferry, Window Fastening.—6,006, J. C. W. Rolfe, London, Blinds for Ventilating.—6,011, G. Connell, Newcastle-upon-Tyne, Ventilating and Air-warming Apparatus.—6,014, W. Cowell, Blackburn, Ventilator.—6,019, J. Kerr, London, Pavements.

April 7.—6,037, T. Grimbleby and H. Grimbleby, Barrow-upon-Humber, Lock-wing Roofing-tiles.—6,045, Z. Levy, London, Ventilator.—6,061, F. Mann, London, Sash-fastener.

April 8.—6,101, H. Hughes, London, Disinfecting Sewers.—6,102, H. Hughes, London, Purifying Water for Houses, &c.—6,107, G. Greig, Harvieston, Ventilating Apparatus.—6,114, J. Cottrell and R. Oakley, London, Ventilation, &c.—6,117, S. S. Phillips and H. F. Green, London, Gully for Drains, &c.—6,118, S. S. Phillips and H. F. Green, London, Traps for Drains, &c.—6,121, J. Tomkins and S. Napper, London, Baths, Lavatories, &c.—6,127, T. Durrans, London, Water-closets, &c.

April 9.—6,146, G. E. Newton, London, Water-cisterns.—6,171, C. W. Lee, London, Painting upon Glass.—6,178, T. Brown, Penicuik, Chimney Cowls and Ventilators.—6,180, F. P. Preston, J. T. Prestige, and E. J. Preston, Deptford, and E. W. De Rusett, Croydon, Water-closets.

April 10.—6,231, E. G. Capon and H. Heaton, King's Norton, Compound Material for Covering Steps, Stairs, Passages, &c.

SPECIFICATIONS ACCEPTED.†

April 8.—945, F. R. Wildgoose, London, Sash fastening.—4,305, A. Emanuel, London, Water-closets.

April 11.—3,274, S. H. Adams, York, Water-closets.

NOTICES TO PROCEED

Have been given on the Date first named.

April 8.—5,640, H. Darby, London, Apparatus for Warming Air for Heating Buildings, &c. (Dec. 4, '83).—5,650, R. Hall and C. C. Woodcock, Leicester, Wood-paving (Dec. 5, '83).

ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending April 12, 1884.

3,870, C. J. Dobbs, Middlesbrough, Manufacture of Paving Blocks from Furnace-slag (Aug. 9, '83, price 6d.).

When the slag has been run into the moulds the blocks are removed as soon as they are set and placed in a kiln, in which are a number of chambers, each of which can contain one block. The blocks are then annealed without any extraneous heat.

3,947, H. Sutton, London, Brushing Apparatus for Cleaning the Walls, Ceilings, &c., of Buildings (Aug. 14, '83, 2d.).

A circular brush is mounted on the end of a rod and rotated by a crank near the handle. (*Pro. Pro.*)

3,951, T. S. Truss, London, Traps (Aug. 15, '83, 2d.).

The inlet-pipe into the trap-box is curved upwards, and on the end is a valve. The rush of liquid through the pipe lifts this valve, which falls again into its seat when the rush has stopped. (*Pro. Pro.*)

3,964, P. Jensen, London, Kitchen-stove Plates. Com. by F. Kohl, Vienna (Aug. 15, '83, 2d.).

Instead of being made in one single piece, these plates are composed of four separate pieces connected together by groove and tongue joints.

4,051, J. P. Rickman and A. B. Wood, London, Tesseræ for Mosaic Work, &c. (Aug. 21, '83, 2d.).

These are made with fangs to secure them in the matrix or bed. (*Pro. Pro.*)

4,127, G. M. Edwards, London, Metal Tables for Ceilings, Partitions, &c. (Aug. 27, '83, 8d.).

Thin strips of sheet iron are used with notched or serrated edges, and in the centre thereof lengthwise is formed a deep groove indented in the metal. The strip is fastened by this groove to the joists, &c., and embedded in the plastic material.

4,150, G. Connell, Newcastle-upon-Tyne, Window-ventilators (Aug. 28, '83, 6d.).

A glazed framing is attached to the window, thereby forming a double window with a chamber inside; and hinged flaps are fitted in the upper and lower parts of this double window. A metal chamber with gas jets is formed below by which the air can be heated and a circulation established in the glazed chamber. By arranging the flaps accordingly air can be passed into or withdrawn from the room, &c., as may be required.

4,213, S. B. Sutcliffe, Manchester, Tile Hearths and Fenders (Sept. 1, '83, 6d.).

The outside of the tile hearth is surrounded by an edging inside of which and sloping down towards the tile-hearth are ornamental tiles.

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* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

† Open to public inspection for two months from the dates named.

4,227, T. J. Palmer, Carshalton, Decorative Material for Walls, &c. (Sept. 3, '83, 6d.).

The pulp is passed through a series of rollers on blankets first and then on wire gauze to express all the moisture, and afterwards through other rollers to emboss the required pattern on the material.

MEETINGS.

SATURDAY, APRIL 19.

Architectural Association.—Visit to Houses in Kensington Court (Mr. J. J. Stevenson, architect). 3 p.m.

Edinburgh Architectural Association.—Visit to Hallyards Castle and Kirkliston.

MONDAY, APRIL 21.

Royal Institute of British Architects.—Business Meeting, for Members only, and Special General Meeting. 8 p.m.

Surveyors' Institution.—Mr. T. Chatfeild Clarke on "Improved Dwellings for Labourers and Artisans." 8 p.m.

Society of Arts (Applied Chemistry and Physics Section).—Adjourned Discussion on Dr. P. F. Frankland's paper on "The Upper Thames as a Source of Water Supply." 8 p.m.

Leeds and Yorkshire Architectural Society.—Members' *Soirée.*

London and Middlesex Archæological Society.—(1) Mr. Thomas Milbourn on "London Clubs." (2) Mr. John E. Price, F.S.A., "On the Recovered Monumental Brass of Sir John Popham, Knt. 1643, with Notes on his connexion with the Church of St. Sepulchre, London." 8 p.m.

Victoria Institute.—Mr. S. R. Pattison on "Evolution and the Pearly Nautilus"; *or* the Rev. J. M. Mello, F.G.S., on "The Prehistoric Factory of Flints at Speinnes." 8 p.m.

TUESDAY, APRIL 22.

Institution of Civil Engineers.—Mr. W. E. Rich, M. Inst. C.E., "On the Comparative Merits of Vertical and Horizontal Engines, and on Rotative Beam Engines for Pumping." 8 p.m.

St. Paul's Ecclesiological Society.—Dr. W. G. F. Phillimore, Q.C., on "The History of the Ecclesiastical Courts." 7·30 p.m.

Anthropological Institute (3, Hanover-square).—(1) Sir Richard Owen on a portrait of an Aboriginal Tasmanian. (2) Professor A. H. Keane on "The Ethnology of the Sudan." 8 p.m.

WEDNESDAY, APRIL 23.

Society of Arts.—Mr. J. B. Redman, M. Inst. C.E., on "Thames Communications." 8 p.m.

Civil and Mechanical Engineers' Society.—Mr. H. M. Whitley on "Modern Locomotive Practice." 7 p.m.

THURSDAY, APRIL 24.

Parkes Museum of Hygiene (74A, Margaret-street, W.). Dr. Voelcker on "Milk." 5 p.m.

Royal Institution.—Professor Dewar on "Flame and Oxidation." (I.) 3 p.m.

FRIDAY, APRIL 25.

Royal Institution.—Mr. Walter Besant on "The Art of Fiction." 9 p.m.

Society of Arts (Indian Section).—Mr. W. G. Pedder on "The Existing Law of Landlord and Tenant in India." 8 p.m.

SATURDAY, APRIL 26.

Artists' Benevolent Fund.—Seventy-fifth Anniversary Dinner (Freemasons' Tavern), Sir Coutts Lindsay in the chair.

St. Paul's Ecclesiological Society.—(1) Visit to the Priory of St. Dominic, Maitland-road, Haverstock-hill. 2.40 p.m. (2) Visit to the Church of St. Augustine, Kilburn, under the guidance of Mr. J. L. Pearson, F.S.A. 4 p.m.

Royal Institution.—Mr. Hodder M. Westropp on "Recent Discoveries in Roman Archæology." (I.) The Colosseum. 3 p.m.

Birmingham Architectural Association.—Mr. W. Tonks on "Exhibitions and Museums."

Miscellanea.

Rebuilding of an Old City Tavern.—The Salutation and Cat Tavern, in Rose-street, Paternoster-square, has just been rebuilt, one of the chief features in the reconstruction being the decorations of the interior. The old tavern was destroyed in the great fire in Paternoster-square, two or three years ago. The Rose-street frontage of the new building is limited to 19 ft., but the ground area occupied by the building is nearly 5,000 ft. The upper part of the elevation is faced with red-pressed brick, the arched windows having terra cotta keys. Amongst other apartments in the basement is a spacious billiard-room fitted in American walnut, the mural decorations of the apartment consisting of ornamental tiles and mirrors. The apartments on the ground-floor consist of a large grill-room, also coffee and smoking-rooms, public and private luncheon-rooms, all richly decorated. This floor is entirely fire-proof, being of concrete on Dennett & Ingle's principle. The first-floor contains a large banqueting-room, the walls being painted in panels and decorated with mirrors. On the same floor is a Masonic temple, having a domed ceiling, with sun-light in the centre, the walls being decorated with emblems representative of the craft. On this floor there are also several private dining and reception-rooms. Messrs. Wylson & Long, of King William-street, Strand, are the architects, and Messrs. Pickersgill Bros. the contractors; Mr. Smith is foreman of the works. The estimated cost of the building is about 16,000*l.*

The Difficulties of Tunnel Construction. The questions of the heat of the earth and the ventilation of long tunnels are of a nature that cannot be overlooked in constructing such tunnels, as recent experiences have shown. M. E. Stockalper, in "Les grands Tunnels et la Chaleur souterraine," treats especially of the effects exerted by a continuous high temperature upon the health of the workmen employed in St. Gotthard Tunnel. Injurious effects began to be felt as soon as the temperature of the rock was higher than 29° C. This temperature was reached at 4·5 kilomètres from the northern entrance, and 5·5 kilomètres from the southern entrance; in the intervening length of 5 kilomètres it was higher, and on the average about 31° C.; but the temperature of the air rose in some places as high as 32·5°, and even to 35° C., which, combined with its high degree of moisture, brought on illness in many cases. Three months before the final perforation of the headway 60 per cent. of the workmen on the southern side were ill, 12 per cent. seriously. Of the horses employed, towards the close of the tunnelling operations, ten died on the average per month on each side of the tunnel. Wages had to be raised 25 per cent., and the working hours had to be reduced from seven to five. Professor Du Bois-Reymond states that in perfectly dry air the temperature may rise to 50° C. without stopping work entirely, but that, if the air is saturated with steam, no one can resist permanently a temperature of 40°.—*Iron.*

National Refuge Harbours.—A discussion on this subject will take place in the House of Lords immediately after the Easter recess, on the motion of Lord Waveney, chairman of the committees of the National Refuge Harbours Society. A public meeting of the Society will also take place at the Town-hall, Kensington, at the suggestion of the Hon. and Rev. E. Carr Glynn, vicar of the parish. Those who desire to save the lives of our sailors and fishermen are earnestly asked to support these efforts, without a moment's delay, by petitions to the Houses of Lords and Commons, by subscribing to the funds of the Society, or by every other means in their power. Forms of petition will be sent by return of post, with a report of the speeches at the Mansion House, on writing to Mr. F. Johnson, 17, Parliament-street, London. A certain number of convicts are yet engaged as farm labourers and in certain trades, with disadvantage to the State. These might all, it is urged, be better engaged upon national harbours, as one of the resources by which work of this nature might be accomplished, instead of interfering, as sometimes at present, with trade and labour, earning only about one half the amount of money it costs to maintain them, and their wives and families being sometimes supported by their parishes. Convicts alone are not, however, a sufficient resource, nor is convict labour suitable for some places.

Wood and Tile Pavements.—It is well known that wood pavements have been and are gradually taking the place of asphalte in London. This example has been followed to some extent by Paris, where many streets have been recently paved with wood. Some time ago pavements of tiles were experimentally tried in London. This tile pavement has now also been introduced at Berlin, where cubes 20 centimètres (7·8 in.) square and 10 centimètres (3·9 in.) thick, and impregnated with bituminous products up to 20 per cent. of their volume, are employed. The cubes are laid on concrete 15 centimètres (6 in.) thick, and the joints filled up with hot tar. It is affirmed that this description of pavement is superior to wood pavement. Whilst the latter is liable to absorb organic products of decomposition like a sponge, thus forming a hotbed of disease, a tile pavement is completely free from those drawbacks. It permits the water to flow off freely, and lasts much longer than wood pavement, which, moreover, may become extremely dangerous in case of fire.—*Iron.*

Organ, St. John's Church, Little Holbeck.—Services have lately been held in this church, in connexion with the inauguration of a new organ, which has been built by Messrs. Wordsworth & Maskell, Leeds, and a number of recitals have been also arranged. The external parts of the instrument, which are of wainscot oak, have been constructed from drawings by Mr. W. C. Marshall, of London. The front harmonises with the architectural character of the church, which was erected from one of Sir Gilbert Scott's designs.

The Projected Battersea and Wandsworth Public Hall.—Some twelve months ago the foundation stone was laid, with considerable ceremony, of an intended new public hall for Battersea and New Wandsworth, the site being at the corner of Lavender Hill and St. John's Hill, close to Clapham Junction. The undertaking was promoted by the Battersea and New Wandsworth Public Halls Company, and the building was intended to be a handsome architectural structure, designed by Messrs. Morris & Stallwood, of Reading. (A view of the proposed building was given in the *Builder* for March 17, 1883.) The two frontages on the ground-floor were to contain ten shops, and in the rear of these, also on the ground-floor, there was to have been a suite of rooms for the accommodation of a club,—the apartments to include reading, coffee, smoking, and billiard rooms, a special feature being a winter garden in immediate connexion with the club apartments. The design provided for a public hall, intended for meetings and entertainments, on the first floor, having in connexion with it retiring rooms and several other apartments. The contract for the erection of the building was taken at about 10,000*l.* by Mr. Smith, of Vauxhall, who proceeded with the work; but, when the basement walls were finished and the ground line was reached, and all in readiness for going on with the superstructure, the works were suddenly brought to a stand owing to the financial difficulties of the company. Legal proceedings followed, resulting in liquidation and the winding-up of the company; and within the last few days the site, with the building so far as it has proceeded, has been secured by a large firm of drapers in Wandsworth, who announce that they are about to erect eight shops, five of which will be occupied by themselves, whilst the remaining three are advertised to let when completed.

Society of Arts.—The following meetings of the Society of Arts have been arranged:—Ordinary meetings (on Wednesday evenings)—April 23, "Thames Communications," by J. B. Redman, M.Inst.C.E. April 30, "The New Legislation as to Fresh-water Fisheries," by J. W. Willis-Bund. May 7, "Bicycles and Tricycles," by C. V. Boys. May 14, "Telpherage," by Professor Fleeming Jenkin, F.R.S. May 21, "Telegraph Tariffs," by Lieut.-Col. Webber, R.E. May 28, "Primary Batteries for Electric Lighting," by I. Probert. In the Foreign and Colonial Section the following paper will be read on April 29, "The Transvaal Gold Fields; their Past, Present, and Future," by W. Henry Penning. In the Applied Chemistry and Physics Section, the adjourned discussion on Dr. Percy Frankland's paper, "The Upper Thames as a Source of Water Supply," is fixed for Monday, April 21. On May 8, a paper will be read on "Cupro-Ammonium Solution and its Use in Waterproofing Paper and Vegetable Tissues," by C. R. Alder Wright, F.R.S., D.Sc.; and on a subsequent evening a paper, "Economic Applications of Seaweed," by Edward C. Stanford, F.C.S., will be read. In the Indian Section the following papers will be read:—April 25, "The Existing Law of Landlord and Tenant in India," by W. G. Pedder. May 9, "Indigenous Education in India," by Dr. Leitner. May 30, "Street Architecture in India," by C. Purdon Clarke, C.I.E.

The New Railway Works at Blackfriars.—Messrs. Lucas & Aird, the contractors for the London, Chatham, and Dover Company's new station and bridge across the Thames at Blackfriars, are making rapid progress with the undertaking. That portion of the station buildings nearest the river has already been carried to a height of upwards of 20 ft., and the Middlesex shore abutments are also making considerable progress. The excavations down to the bed of the river for the foundations of the piers of the bridge have formed a heavy portion of the engineering work, but this has now been almost entirely completed, and the construction of the piers themselves is now being proceeded with. The mid-river pier is in the most advanced state, having already been carried to a height of several feet above high-water mark. Unlike the piers of the existing bridge, which are of stone and circular in form, those of the new bridge are composed of grey granite and are square in form. About 300 artisans are employed upon the works, which are being carried on continuously, both day and night, by relays of hands.

Improved Construction of High Buildings.—Mr. Frederick Baumann, architect, of this city, has prepared a plan for an improved construction of high buildings, which, in view of the present discussion on the subject, demands consideration. The design is to erect on foundations a firm and rigid skeleton or hull of iron, and cover it at once with a proper roof. The enclosure, whether of stone, terra cotta, or brick, or any combination of these materials, may be erected at the same time the iron structure is being put in place. But the latter might proceed much faster than the former; while the hull might be roofed within two months, the enclosure might not have proceeded further than the fourth story. Thus there need be no delay to a steady progress. Derricks may be set on the roof for finishing the enclosure in a convenient manner. Large, unwieldy, and dangerous derricks may thus be discarded. At the same time that the work on the iron structure is progressing, the partitions, fireplaces, vaults, arching of ceilings, and lining of exterior walls may be put in; thus all interior work would be done and made ready for plastering during the time required for constructing the exterior parts. Mr. Baumann claims that this method would render the work more independent of the weather than by the usual construction; the erection of the iron hull is, in its nature, a rapid process. The practicability of erecting buildings on Chicago soil, twelve and more stories high, then becomes a fact.—*Chicago Sanitary News.*

The American "Elevator."—The ability not only to erect high buildings, but to get, in the States, as much, or even more, rent for the upper floors than the lower, is a direct consequence of the use of the elevator. Thus a New York paper states that "Mr. Cyrus W. Field has completed his new structure, the Washington building, at the Battery, and applicants for rooms are so numerous that almost any price can be asked. There are five elevators in the building, and consequently the upper floors bring more money than the lower ones. An idea of the traffic done in one of these huge buildings may be formed from some statistics which Mr. Field has gathered. On an average 18,000 persons a day pass in and out of the Produce Exchange Building, the Mills building 13,000, the Borell about 10,000, and the Equitable Life about 15,000." The makers of these elevators which are so much appreciated over the water, are now, under the general name of the "American Elevator Company," "elevating" in London and Paris as well as in New York and Chicago.

"White's Hygeian Rock" Composition.—Before the Building Exhibition closed a number of architects, engineers, and contractors were invited by Mr. William White, of 3, Westminster-chambers, to witness some tests at the Agricultural Hall, Islington, for the purpose of illustrating the great amount of strength imparted to walls (in addition to their being rendered waterproof) by the introduction of this now well-known and extensively used material. A correspondent informs us that one brick beam 9 in. thick, four courses high, was encircled in the centre by chains to which was attached to a large scale; this was then weighted to the extent of 1 ton 1 cwt. 3 qrs. 3lb. before the beam fractured. A similar beam 14 in. thick bore 2 tons 1 cwt. 3 qrs. 3 lb. in the centre without the slightest sign of breakage or even deflection, being ultimately broken by a blow from a heavy sledge-hammer while sustaining this weight. Each of the beams was 6 ft. long, with 4½ in. bearing each end.

The Exhibition at Carpenters' Hall.—At the Exhibition of Carpentry and Joinery, at Carpenters' Hall, the Council of the Royal Institute of British Architects have promised to exhibit some of the drawings, &c., illustrative of those subjects in their library. The Royal Architectural Museum will exhibit the well-known drawing of the Flèche of Amiens Cathedral, by the late William Burges; and Mr. Street will contribute his father's drawings for the roof and flèche of the Law Courts.

A Statue for Weymouth.—For his princely acts of generosity bestowed on the town, and his having been for twenty years their representative in Parliament, the people of Weymouth have determined on erecting a marble statue of Mr. H. Edwards, M.P. for their borough, at a cost of 700 guineas. The sculptors selected to do the work are Messrs. W. & T. Wills, of London. The statue will be placed in the centre of the Alexandra Gardens.

Institution of Mechanical Engineers.—The next ordinary general meeting of this Institution will be held on Thursday, May 1st, and Friday, May 2nd, at 25, Great George-street, Westminster, by the kind permission of the Council of the Institution of Civil Engineers, when the following papers will be read and discussed, as far as time will admit:—

On Thursday, May 1st.—On the Consumption of Fuel in Locomotives, by M. Georgies Marié, of Paris; on Portable Railways, by M. Paul Decauville, of Petit-Bourg, Paris; on the Moscrop Engine Recorder, and the Knowles Supplementary Governor, by Mr. Michael Longridge, of Manchester.

On Friday, May 2nd.—Description of the Automatic and Exhaust-Steam Injector, by Mr. A. Slater Savill, of Manchester; Description of the Apparatus used for Testing Current-Meters, at the Admiralty Works at Torquay for experimenting on models of ships, by Mr. Robert Gordon, of Burmah; Description of the Francke "Tina" or Vat Process for the Amalgamation of Silver Ores, by Mr. Edgar P. Rathbone, of London.

Visitors' tickets for the meeting can be had on application to Mr. Alfred Bache, the secretary, at 10, Victoria Chambers.

The Butchers' Company's New Hall.—The court of this company have selected the design of Mr. Alexander Peebles, F.R.I.B.A., from amongst those which were submitted to them by invitation for their new hall about to be erected in Bartholomew-close in the City, and have instructed Mr. Peebles to proceed with the necessary works. The design is in the Classic style, freely treated, and the building will contain the hall, court, and committee-rooms, offices for the officers of the company, a ladies' drawing-room, and all other necessary and suitable domestic and other apartments.

Accident Assurance.—The report of the Ocean Railway and General Accident Assurance Company (Limited) shows that the income from new business for 1883 was 13,446*l.* 3s. 5d., bringing the total income for the year to 32,908*l.* 13s. 11d. as against 28,298*l.* 2s. 4d. for the previous year. The usual dividend was declared. The suspense account, or reserve, now amounts to 7,492*l.* 4s. 3d.

TENDERS.

For alterations and additions to Nos. 74, 75, 76, 77, and 78, Judd-street, Euston-road, for the Midland Furnishing Company. Mr. D. H. North, architect:—

Rider & Son	£2,138 0 0
Woods	2,100 0 0
Colls	1,877 0 0
Gould & Brand	1,792 0 0
Burman & Son	1,736 0 0
Langmead & Way	1,697 0 0
Anley	1,670 0 0

Accepted for new headquarters, gymnasium, and drill hall, for 3rd Lanark Rifle Volunteers, Glasgow. Mr. John B. Wilson, architect, Glasgow. Quantities by Mr. W. J. Hall, Glasgow:—

J. Paterson, Glasgow (mason and brickwork)	£1,478 5 0
W. Wyper (wright work)	839 0 0
Nicol & McVicar, Govan (plaster work)	102 6 10
J. & T. Stewart, Glasgow (slater work)	146 10 10
A. Bruce (plumber work)	120 0 0
A. Bruce (gasfitting)	64 0 0
P. & R. Fleming (iron roof)	650 0 0
R. L. Lowe, Tamworth (wood block floor)	360 0 0

For new gasholder tank at Peterborough. Mr. G. E. Stevenson, engineer:—

H. B. James, Westminster	£2,371 19 3
F. E. Street & Co., 27, Red Lion-square, W.C.	2,346 14 0
B. Cooke & Co., Battersea	1,841 4 2
Dudson & Parrish, Nottingham	1,985 19 8
W. J. Botterill, 110, Cannon-st., E.C.	1,757 0 0
Jas. Hellett & Co., Leicester	1,711 16 6½
Henry Hicks, Peterborough	1,528 14 8½
Chas. J. Corrie, Lichfield	1,503 4 11
Bryan W. Ward, Leicester	1,365 0 0

For additional works at "Kirkdale," Woodberry Down, Finsbury Park. Mr. Wm. Smith, architect:—

D. Lang	£579 0 0
J. Anley	570 0 0
Mattock Bros.	569 0 0
J. Larke	530 0 0
Clarke	527 0 0
Stevens	485 0 0
W. Shurmur	432 0 0
J. Harper	393 10 0

For alterations at Caroline Villa, Woodberry Down, Finsbury Park. Mr. Wm. Smith, architect:—

D. Lang	£176 0 0
J. Anley	170 0 0
W. Shurmur	153 0 0
J. Larke	138 0 0
Clarke	137 0 0
Stevens	132 0 0
Mattock Bros.	128 0 0
J. Harper	113 10 0

For the erection of stabling at Lea Valley, Upper Clapton. Mr. J. Hamilton, architect:—

H. Harper	£425 0 0
S. Hayworth	347 0 0
W. Shurmur	315 0 0
Woolveridge	298 10 0

For the erection of a villa residence, Southwood, St. Lawrence, Ramsgate, for Mr. James Frost. Mr. E. L. Elgar, architect, Ramsgate:—

Martin	£518 0 0
White Bros.	495 0 0
Miller	470 0 0
J. Newby	458 0 0
Lavender	454 0 0
Home	450 0 0
Newby Bros. (accepted)	414 0 0

[All of Ramsgate.]

For addition of west end and tower of St. Peter's Church, Streatham-hill, S.W. Mr. George H. Fellowes Prynne, architect, 10, Torrington-square. Quantities by Mr. R. Henry Hale:—

John Walker, Streatham	£5,760 0 0
Piersy & Co., Westminster	4,576 0 0
William Mason, Streatham	3,893 0 0
Perry & Co., London, E.	3,515 0 0
Dove Bros., Islington	3,385 0 0
Frank Saunders, London, W.	3,376 0 0
T. H. Adamson & Sons, Putney	3,357 0 0
Goodard & Sons, Farnham	3,346 0 0
J. & C. Bowyer, Upper Norwood*	3,190 0 0
Cowland & Co., Bayswater†	3,044 0 0

* Accepted. † Amended.

For the erection of a new Grammar School in Upper Lindum-street, Lincoln, from plans and specification prepared by Mr. W. Watkins, architect, of St. Edmond's Chambers:—

	Main Building. £. s. d.	North Wing. £. s. d.	Total. £. s. d.
Martin & Sims	2,340 0 0	612 0 0	2,952 0 0
Cowen & Lansdown	2,296 2 0	630 10 0	2,926 12 0
Walter & Hensman Horncastle	2,295 5 0	616 0 0	2,911 5 0
Knight, Martin	2,197 10 0	592 10 0	2,790 0 0
Bennett, Birmingham	2,197 0 0	627 0 0	2,824 0 0
J. B. Harrison	2,167 8 0	623 18 0	2,791 4 0
W. Wright	2,154 0 0	586 0 0	2,740 0 0
Baines, Newark	2,154 0 0	571 10 6	2,725 10 6
H. S. & W. Close	2,115 0 0	589 0 0	2,704 0 0
Crosby & Sons	2,105 0 0	555 0 0	2,660 0 0
Greenwood, Mansfield*	2,055 0 4	566 4 4	2,621 4 8

* Accepted conditionally.

For the forming, levelling, and laying foundations, &c., in Chatsworth-street and Back Manchester-road (north), and the sewering of Sandwich-street and Back Manchester-road (south), Worsley (Contract No. 21), and for the sewering, forming, levelling, and laying foundations, &c., in Alfred and John streets, Worsley (Contract No. 22), for the Barton-upon-Irwell Sanitary Authority. Mr. John Price, surveyor:—

	Contract No. 21.	Contract No. 22.
J. Unsworth, Walkden	£537 16 11	£375 1 11
G. Unsworth, Moss Side	513 1 1	428 6 6
E. Bird, Chorlton	497 0 0	412 0 0
J. Randall, Weaste	471 19 11	387 8 0
M. Naylor, Hulme	467 19 8	392 14 11
R. Lomax, Eccles	398 3 10	320 14 2
J. Oakes, Kearsley	383 1 6	329 18 7
W. H. Worthington, Rusholme	382 15 4	291 14 8*
Snape & Sons, Eccles	360 13 0	283 4 10
Hamnett & Shaw, Ashton-on-Mersey	354 4 0	310 10 5
W. & J. Armstrong, Walkden	326 6 0*	—

* Accepted.

For new hall at Kennington Park, for the St. James's Temperance Mission and Lecture Hall Company, Limited. Mr. Banister Fletcher, architect. Quantities by the architect:—

S. Sabey & Son	£4,200 0 0!
C. Miller & Son	4,150 0 0
Building, Fitting, and Furnishing Co., Limited	3,650 0 0
W. R. Cubitt	3,495 0 0
W. & H. Castle	3,493 0 0
W. H. Loden & Son	3,390 0 0
Staines & Son	3,292 0 0
R. G. Battley	3,184 0 0
H. Burman & Sons	3,163 0 0
F. Higgs	3,160 0 0
J. Garrud	2,973 0 0
Haggatt & Brown	2,971 0 0
D. S. Rice	2,967 0 0
Couzins & Simmons	2,950 0 0
Leech Bros.	2,940 0 0
H. Buchan	2,896 0 0
W. H. Parker	2,824 0 0
Aldridge & Jenvey	2,542 0 0!
Magee & Co.*	1,300 0 0

* Withdrawn; stated to be a clerical error.

For additions and alterations at the Circus Café, Oxford-street, for Messrs. Gianella & Co. (1st contract). Mr. Banister Fletcher, architect:—

J. Mansbridge	£2,499 0 0
B. E. Nightingale (accepted)	1,962 0 0

For the erection of new premises, Nos. 62 and 63, Basinghall-street. Mr. Richd. M. Rowe, 57, Basinghall-street, architect. Quantities supplied by Messrs. Batstone Bros.:—

J. Grover (accepted)	£4,210 10 0

For office and show-room fittings, at No. 130, London Wall, E.C. Mr. Richd. M. Rowe, architect:—

Somerville & Smith	£782 11 9
Frederick Sage	686 0 0
Drew & Cadman (accepted)	583 4 0

For the erection of a new wing to the Infirmary, Cale-street, Chelsea, for the Guardians of Chelsea. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities supplied:—

Nightingale	£9,007 0 0
W. Johnson	8,817 0 0
W. Downs	8,483 0 0
Magee & Co.	8,400 0 0
Stephens & Bastow	8,295 0 0
Howell & Son, London and Bristol*	7,951 0 0

* Accepted.

For erecting and completing four shops, banking premises, and stables, for the London and South-Western Bank, at Church-street, Camberwell. Messrs. J. & J. S. Edmeston, architects. Quantities supplied:—

Mackie	£14 501 0 0
Braid	13,500 0 0
Adamson	12,981 0 0
Kilby & Gayford	12,800 0 0
Kirk & Randall	12,794 0 0
Colls & Sons	12,577 0 0
Wall Bros.	12,472 0 0
Stafford	12,400 0 0
D. D. & A. Brown	12,390 0 0
Boyce	12,370 0 0
Johnstone	12,276 0 0
Hobbs	12,250 0 0
Bowyer	11,969 0 0
Shephard	11,875 0 0
Kinnoch	11,748 0 0

Accepted for the construction of a culvert and sewers, &c., at Crouch End and Finsbury Park, for the Hornsey Local Board. Mr. T. de Courcy Meade, engineer and surveyor:—

Contract A.—New sewers, &c., in Upper Tollington Park, and Lancaster-road:—

E. & W. Iles, Wimbledon	£1,460 0 0

Contract B.—New sewers, &c., in Oakfield-road:—

E. & W. Iles, Wimbledon	£475 0 0

Contract C.—New sewers, &c., in Stapleton Hall-road, Victoria-road, and Albert-road:—

Cook & Co., Battersea	£853 0 0

Contract D.—New sewers, &c., in Ferme Park-road South:—

F. A. Jackson & Son, Finsbury Park	£373 0 0

Contract E.—New sewers, &c., from Claremont-road to Coolhurst-road, Crouch End:—

F. A. Jackson & Son, Finsbury Park	£520 0 0

Contract F.—New storm-water culvert and pipe sewers on the Crouch Hall Estate:—

Cook & Co., Battersea	£2,627 0 0

For a new front to upholsterer's shop in Goldsmith-street, Nottingham. Mr. Fredk. Jackson, architect, Nottingham:—

W. Collison	£177 0 0
J. Cooper	153 10 0
H. Marriott	134 15 0
Huskinson & Jefferys (accepted)	127 0 0
J. Cargill	115 0 0

For the conversion of dwelling-house into shops, situate in Goldsmith-street, Nottingham. Mr. Frederick Jackson, architect, Nottingham:—

W. Collison	£870 0 0
J. Cargill	753 0 0
H. Marriott	734 0 0
J. Cooper	710 0 0
Huskinson & Jefferys (accepted)	647 0 0

For erecting and completing farm buildings at Broxbourne Farm, Broxbourne, for Mr. W. L. Bosanquet. Messrs. F. Yigers & Co., surveyors. Quantities not supplied:—

Colls & Sons	£970 0 0
D. D. & A. Brown	966 0 0
Hunt	897 0 0
Newlan	790 0 0

For boundary-wall at the Lambeth Workhouse. Mr. T. W. Aldwinckle, architect:—

Hammond	£312 10 0
Riches	297 10 0
Cook	293 0 0
Whittingham	290 0 0
Ansell	280 0 0
Tyerman	273 0 0
J. & H. Mills	265 0 0
Tye	249 0 0
Higgatt & Brown	235 0 0

Accepted for additions to Lillyburne House, Milton of Campsie, near Glasgow, for Mr. A. McNab. Mr. John B. Wilson, architect, Glasgow. Quantities by Mr. W. J. Hall, Glasgow:—

Fletcher Bros., Kirkintilloch (masons)	£823 6 8
A. Ferguson, Glasgow (wright)	676 0 0
Caldwell & Sons, Kirkintilloch (slaters)	36 19 3
A. Bruce, Glasgow (plumber)	100 0 0
J. Bryden & Sons, Glasgow (gas and bells)	23 19 1

For the erection of new Congregational Church at Haverhill, Suffolk, and conversion of the old one into schools. Mr. Charles Bell, architect:—

Mason & Son, Haverhill (accepted)	£4,522 0 0

[No other tenders.]

For proposed schools at Denmark-street, Barking-road, for the West Ham School Board. Mr. J. T. Newman, architect, 2, Fen-court. Quantities by Messrs. Curtis & Sons:—

	Superstructure.	Extra Foundations.
Burman & Son	£10,400	£717
Hearle & Son	10,147	827
A. Reed	9,640	800
G. J. Hoskings	9,595	689
J. Morter	9,480	654
W. Gregar	9,237	590
J. W. Hobbs	9,130	620
M. Gentry	9,000	730
Magee & Co.	8,936	564
J. Holloway	8,850	490
Priestley & Gurney	8,698	636
G. J. Horlock (accepted)	8,429	596

[Cost per head for 1,272 children, 7*l.* 1s. 10d.]

For proposed infirmary, Chatham, for the Medway Union. Mr. E. W. Stephens, architect, Maidstone:—

Trueman & Co., Luton	£8,695 0 0
Slade, Maidstone	8,550 0 0
Skinner, Chatham	7,803 0 0
Denne & Son, Deal	7,700 0 0
Wilkins, Maidstone	7,512 0 0
Bull & Sons, Southampton	7,432 0 0
Harris, St. Andrews, N.B.	7,350 4 0
Vaughan, Maidstone	7,350 0 0
Wallis & Clements, Maidstone	7,344 0 0
Avard, Maidstone	7,233 0 0
Pankhurst & Son, Chatham	7,160 0 0
Naylor & Son (accepted), Rochester	6,993 0 0

For alterations and additions to No. 2, Wilton-road, Pimlico, for Mr. Eli Turner. Quantities by Mr. Edward Crutchler, Albert Chambers, Victoria-street, Westminster:—

T. Gregory	£998 0 0
Martin, Wells, & Co.	880 0 0
W. King & Son	865 0 0
Reading	849 0 0
Falkner	835 0 0
J. M. Macey & Sons (accepted)	820 0 0

[Surveyor's estimate, 850*l.*]

For erecting new town-hall and public offices, Kirkwall. Mr. T. S. Peace, Junction-road, Kirkwall, architect. Quantities by Mr. Andrew Lawrie, ordained surveyor, George-street, Edinburgh:—

W. Firth, Kirkwall	£4,425 13 8
S. Baikie & Sons, Kirkwall (accepted)	3,993 0 0

[All other tenders received for portions only.]

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

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Corsham Down,
And Farleigh Down.
RANDELL, SAUNDERS, & CO., Limited,
Corsham, Wilts. [ADVT.

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Is the Best for Use in all Exposed Positions, being a well-known and tried Weather Stone.
50,000 feet cube in stock.
PICTOR & SONS, BOX, WILTS.
[ADVT.

Doulting Freestone and Ham Hill Stone of best quality, in blocks, or prepared ready for fixing. An inspection of the Doulting Quarries is respectfully solicited; and Architects and others are CAUTIONED against inferior stone. Prices, delivered to any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset.—Agent, Mr. E. WILLIAMS, 73, Charlotte-street, Portland-place, W. [ADVT.

Doulting Freestone,
HAM HILL STONE,
BLUE LIAS LIME
(Ground or Lump),
Of best quality, supplied from their own Quarries and Kilns by STAPLE & HANN, Stoke, Ilminster.
Agent, Mr. H. MITCHELL, 5, Augustus-road, Hammersmith, London, W. [ADVT.

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Seyssel, Patent Metallic Lava, and White Asphaltes.
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Manufacturers of

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LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every Description
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DISCOUNT TO BUILDERS. LONDON, S.E.

GOLD AND SILVER MEDALS AT AMSTERDAM EXHIBITION.
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F. BRABY & CO.,
LONDON, LIVERPOOL, GLASGOW.
VIEILLE MONTAGNE BRAND.
NO SOLDER.
NO EXTERNAL FASTENINGS.
PARTICULARS ON APPLICATION. CHIEF OFFICE: 360, EUSTON ROAD, LONDON.